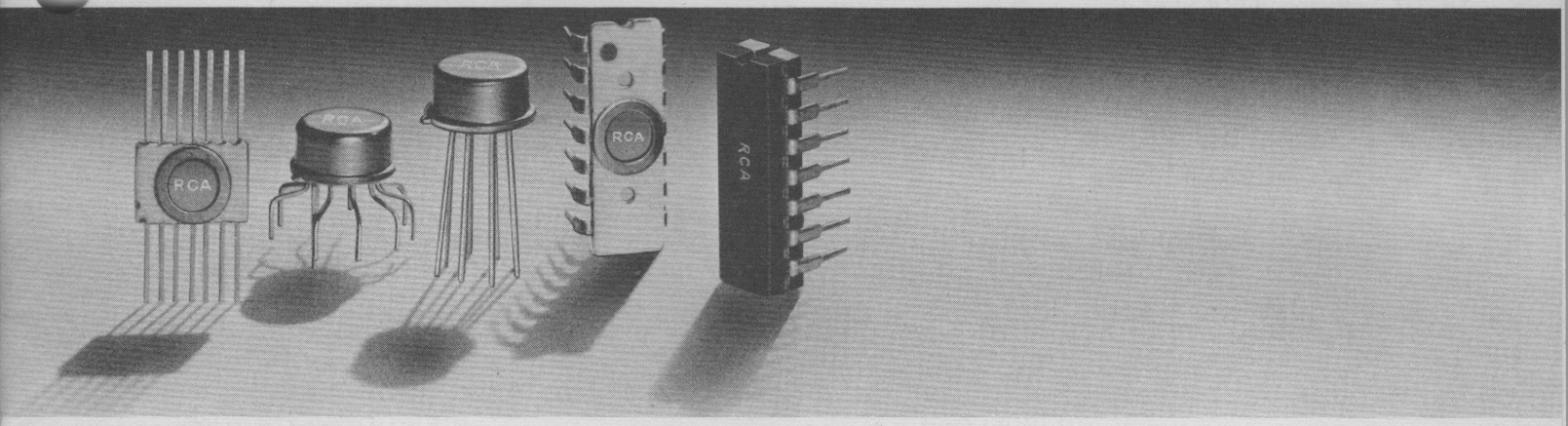
Suggested Price Twenty-Five Cents

RCA integrated circuits product guide



RCA Electronic Components Harrison, New Jersey 07029 CDL-820B

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▲ Emitter-coupled current-steered logic, pronounced "EXCEL"

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CD2308D/962	16-17
CD2308E/862	16-17
CD2309/963	16-17
CD2309D/963	16-17
CD2309E/863	16-17
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CD2310D	16-17
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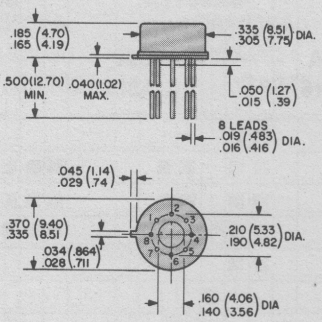
RCA integrated circuits

Dimensional Outlines

Dimensions shown in parenthesis are in millimeters and are derived from the basic inch dimensions as indicated.

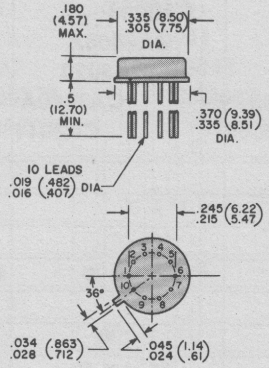
TO-5 Style 8-Lead Package

CA3028A
CA3028B
CA3031/702A
CA3032/702C



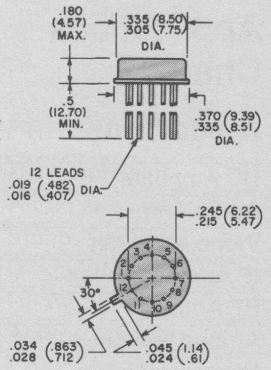
TO-5 Style 10-Lead Package

CA3000
CA3002
CA3011
CA3012
CA3013
CA3014
CA3019
CA3034
CA3035
CA3036
CA3044



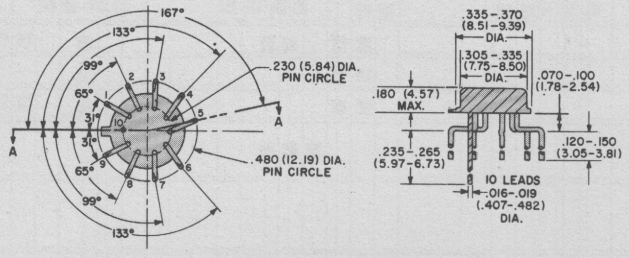
TO-5 Style 12-Lead Package

CA3001
CA3004
CA3005
CA3006
CA3007
CA3010
CA3010A
CA3015
CA3015A
CA3018
CA3018A
CA3020
CA3020A
CA3021
CA3022
CA3023
CA3026
CA3039
CA3043
TA5385



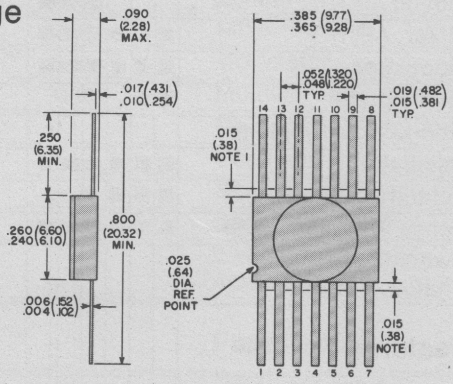
TO-5 Style 10 Formed-Lead Package

CA3034V1
CA3035V1
CA3044V1



14-Lead Ceramic-to-Metal Flat Package

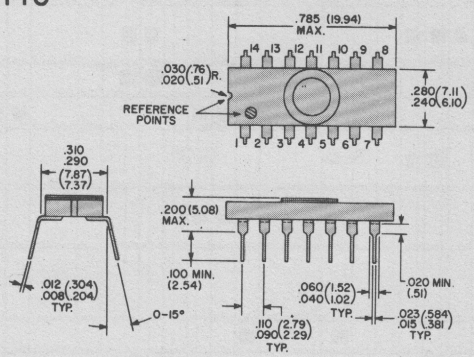
CA3008
CA3008A
CA3016
CA3016A
CD2100
CD2101
CD2150
CD2151
CD2153
CD2200
CD2201
CD2202
CD2203
CD2204
CD2205
CD2300/930 Series



All flat packages are shipped in the RCA CX3300 carriers.

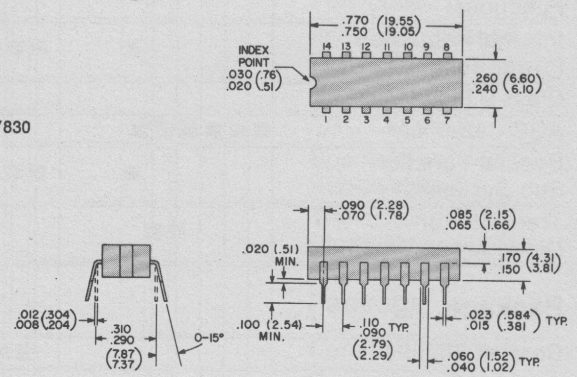
14-Lead Dual In-Line Ceramic Package JEDEC-to-116

CA3033
CA3033A
CA3037
CA3037A
CA3038
CA3038A
CA3045
CD2200D
CD2201D
CD2202D
CD2203D
CD2204D
CD2205D
CD2300D/930 Series
TA5361
TA5362
TA5388
TA5406
TA5455
TA5456
TA5459



14-Lead Dual In-Line Plastic Package

CA3029
CA3029A
CA3030
CA3030A
CA3041
CA3042
CA3046
CD2300E/830 Series



RCA linear integrated circuits

The Linear Integrated Circuit Quick-Reference Applications Chart has been prepared to assist equipment designers in selecting the most suitable integrated circuit for a specific application.

The chart is divided into two sections. The first section lists basic applications for Linear Integrated Circuits. The second section, which includes package information, gives some of the important features of these circuits.

1. A black or red square marks the intersection of any application with the corresponding RCA CA-Series types recommended for that application. Types which are particularly suitable for a specific application are indicated by a red square.

2. Types intended for the same application may have different features. Therefore, when selecting a type for a required application, check the Features Section for those device features which meet the specific design requirements.

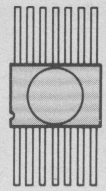
Quick-Selection Applications Chart

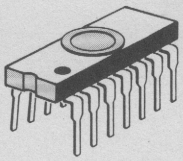
RCA Types for • Communications Equipment • Data Processing Equipment •

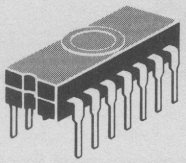
Application	CA3000 CA3001 CA3002 CA3004 CA3005 CA3006	CA3007 CA3008 CA3008A CA3010 CA3010A CA3011	CA3012 CA3013 CA3014 CA3015 CA3015A CA3016	CA3016A CA3018 CA3018A CA3019 CA3020 CA3020A	CA3021 CA3022 CA3023 CA3026
DC Amplifier	■ ■ ■			■ ■	■
Audio Amplifier	■ ■ ■ ■ ■ ■	■		■ ■ ■ ■	■ ■ ■ ■
Video Amplifier	■ ■ ■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■
IF Amplifier	■ ■ ■ ■ ■ ■	■	■ ■ ■	■ ■	■ ■ ■ ■
RF Amplifier	■ ■ ■ ■ ■			■ ■	■
Analog Switch				■	
Comparator	■	■ ■	■	■	
Detector: AM, FM, Phase, Product	■ ■ ■ ■ ■		■ ■	■ ■ ■	■
Differential Amplifier	■ ■ ■ ■ ■			■ ■	■
Limiter	■ ■ ■ ■	■	■ ■ ■	■ ■ ■	■ ■ ■ ■
Mixer: AF, RF	■ ■ ■ ■ ■ ■			■ ■ ■ ■	■
Modulator	■ ■ ■ ■ ■ ■			■ ■ ■	■
Multivibrator	■ ■			■ ■	■
Operational Amplifier		■ ■ ■ ■	■ ■	■ ■	
Oscillator	■ ■ ■ ■ ■ ■			■ ■ ■ ■	■
Schmitt Trigger	■ ■ ■			■ ■	■
Sense Amplifier	■ ■ ■ ■ ■ ■			■ ■	■
Switching: Analog, Power				■ ■ ■	
Features					
Balanced Input	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■	■	■
Balanced Output	■ ■ ■ ■ ■	■			■
Low Noise (1/f)		■ ■ ■ ■	■ ■ ■	■ ■ ■	■
Multiple Simultaneous Functions			■ ■	■ ■ ■	■
Internal Regulated Power Supply		■	■ ■ ■	■ ■	
Class B Power Output				■ ■	
AGC Capability	■ ■ ■ ■ ■ ■			■ ■	■ ■ ■ ■
Special-Function Sub-System			■ ■		
Transistor or Diode Array				■ ■ ■	■
Package					
Ceramic Flat Pack		■ ■	■	■	
Ceramic Dual In-Line					
Plastic Dual In-Line					
"TO-5" Style	■ ■ ■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■

For additional data, refer to pages 6 through 13.

TO-5 style

Ceramic flat pack 

Ceramic dual in-line 

Plastic dual in-line 

Instrumentation • Telemetry • Television

CA3028A, CA3028B, CA3029, CA3029A, CA3030, CA3030A	CA3031/702A, CA3032/702C, CA3033, CA3033A, CA3034, CA3034V1	CA3035, CA3035V1, CA3036, CA3037, CA3037A, CA3038	CA3038A, CA3039, CA3041, CA3042, CA3043, CA3044	CA3044V1, CA3045, CA3046	Application
■ ■				■ ■	DC Amplifier
■ ■		■ ■ ■	■ ■ ■	■ ■	Audio Amplifier
■ ■		■ ■		■ ■	Video Amplifier
■ ■	■	■	■ ■ ■ ■	■ ■ ■	IF Amplifier
■ ■				■ ■	RF Amplifier
			■		Analog Switch
■ ■	■ ■	■	■		Comparator
	■ ■		■ ■ ■ ■ ■	■ ■ ■	Detector: AM, FM, Phase, Product
■ ■				■ ■	Differential Amplifier
■ ■			■ ■ ■ ■	■ ■	Limiter
				■ ■	Mixer: AF, RF
■ ■			■	■ ■	Modulator
				■ ■	Multivibrator
■ ■ ■ ■	■ ■ ■ ■	■ ■ ■	■		Operational Amplifier
■ ■				■ ■	Oscillator
				■ ■	Schmitt Trigger
■ ■				■ ■	Sense Amplifier
			■		Switching: Analog, Power
					Features
■ ■ ■ ■ ■ ■	■ ■ ■ ■	■ ■ ■	■	■ ■	Balanced Input
■ ■				■ ■	Balanced Output
■ ■ ■ ■	■ ■	■ ■ ■ ■ ■ ■	■	■ ■	Low Noise (1/f)
	■ ■	■ ■	■ ■ ■ ■ ■	■ ■ ■	Multiple Simultaneous Functions
			■ ■ ■ ■	■	Internal Regulated Power Supply
	■ ■				Class B Power Output
■ ■				■ ■	AGC Capability
	■ ■	■ ■	■ ■ ■ ■	■	Special-Function Sub-System
		■	■	■ ■	Transistor or Diode Array
					Package
					Ceramic Flat Pack
	■ ■	■ ■ ■	■	■	Ceramic Dual In-Line
■ ■ ■ ■			■ ■	■	Plastic Dual In-Line
■ ■	■ ■ ■ ■	■ ■ ■	■ ■ ■	■	"TO-5" Style

RCA linear integrated circuits

RCA Type	Applications and Features	For Circuits, See Page 23	Absolute Maximum Ratings: Ambient Temp. Range Operating °C	Ambient Temp. Range Storage °C	Input Sig. Volt. Single Ended V	Input Sig. Volt. Common Mode V	Maximum DC Input Power P_T mW
Differential Amplifiers							
CA3000	**DC Amplifier** •Schmitt Trigger •RC Coupled Feedback Amplifier •Mixer •Comparator •Crystal Oscillator •Sense Amplifier •Modulator •Wide AGC Range: 90dB typ.		−55 to +125	−65 to +200	±2	±2	300
CA3001	**DC, IF, and Video Amplifier** •Schmitt Trigger •Mixer •Modulator •Differential Input and Output •Emitter-Follower Input and Output •—3dB Bandwidth: 29MHz				±2.5	±2.5	
CA3002	**IF and Video Amplifier** •Product Detector •AM Detector •Schmitt Trigger •—3dB Bandwidth: 11MHz				±3.5	—	
CA3004	**RF/IF Amplifiers** •Push-Pull Input and Output •AGC •Detector •Wide- and Narrow-Band Amplifier •Mixer •Limiter •Modulator •Cascode Amplifier •Video Amplifier CA3004 has linear transfer characteristics, excellent circuit stability and wide dynamic range				±3.5	+3.5 to −2.5	
CA3005	CA3005 and CA3006 feature high gain, sharp limiting characteristics, and exceptional versatility				±3.5	+3.5 to −2.5	
CA3006	CA3005 and CA3006 are identical except for input offset voltage: CA3006, 1mV. max. CA3005, 2.6 mV. typ.				±3.5	+3.5 to −2.5	
CA3007	**AF Amplifier** •Audio Driver •Audio Amplifier •Sound Systems and Communications Equipment •Eliminates Need for Audio Driver Transformer				±2.5	±2.5	
CA3020 CA3020A	**AF Amplifier Applications** •Combines Functions of Preamplifier, Phase Inverter, Driver, and Push-Pull Output on Single Pellet •Audio Preamplifier •Power Amplifier •Servo Amplifier •Power Gain: 58dB typ. •—3dB Bandwidth: 6MHz typ. •Two Input Levels: 40kΩ and 1000Ω •Squelch Flexibility: 3 methods for applying squelch		The CA3020A is like the CA3020 except for the following: Power Output Class B Amplifier— CA3020 (V_{CC} 9V) = 0.55 W typ. CA3020A (V_{CC} 12V) = 1W typ. Sensitivity— CA3020 (400mW) = 35mV typ. CA3020A (800mW) = 50mV typ.				
CA3026	Ratings and Characteristics are shown under Transistor Arrays						
CA3028A	**RF/IF Amplifier** •Differential or Cascode •Converter for FM Broadcast Band •Limiter •Mixer •Oscillator •Useful Frequency Range DC to 120MHz •Only One Power Supply Required •Audio, Sense, and DC Amplifier •Low Substrate and Feedback Capacitance for high bandwidth capability		−55 to +125	−65 to +200	6V peak to peak		For $T_A \leq 85°C$ $P_T = 450mW$ For $T_A > 85°C$ derate 5mW/°C
CA3028B	CA3028B has all the features of CA3028A but in addition is controlled for Input-Offset Voltage, Input-Offset Current, Input Bias Current and features Single- and Dual-ended Operation The CA3028B is especially suitable as a DC and Differential Amplifier in Control Circuits Data for dual-ended operation; for single-ended operation, refer to CA3028A				4 to −2.5 @ $V_{CC} = +6V$ $V_{EE} = -6V$ 7 to −5 @ $V_{CC} = +12V$ $V_{EE} = -12V$		For $T_A \leq 85°C$ $P_T = 450mW$ For $T_A > 85°C$ derate 5mW/°C
High-Gain Wide-Band Amplifiers							
CA3011	•FM IF Amplifiers •Wide-band Amplifiers •High Amplifier Gain: 75dB typ. at 4.5MHz •Limiting Sensitivity: 600 μV typ at 10.7MHz (at knee) •Useful Frequency Range: 100kHz to >20MHz CA3011 is like the CA3012 except for max. recommended dc supply voltage: CA3011, 7.5V; CA3012, 10V		−55 to +125	−65 to +200	±3	—	300
CA3012	•Input Limiting Voltage (at knee) = 300μV at f=4.5MHz		−55 to +125	−65 to +200	±3	—	300
CA3013 CA3014	**FM IF Amplifier/Limiter/FM Detector/AF Amplifiers** •Comprehensive circuit functions in a single package: IF Amplifier, AM and Noise Limiter, FM Detector, Audio Preamplifier •Excellent AM Rejection: >50dB at 4.5MHz		•High Amplifier Gain: 75dB typ. at 4.5MHz •Recovered AF Voltage: 220mV typ. at 4.5MHz, 25kHz deviation CA3013 is like CA3014 except for max. recommended dc supply voltage: CA3013, 7.5V; CA3014, 10V				
CA3020	**AF Amplifier Applications (Combines Functions of Preamplifier, Phase Inverter, Driver, and Push-Pull Output on Single Pellet)** •Audio Preamplifier •Power Amplifier •Useful Freq. Range: DC to 8MHz with resistive load; into VHF with Tuned Circuits •Servo Amplifier •Power Gain 58db typ. •—3dB Bandwidth: 6MHz typ. •Two Input Levels: 40KΩ and 600Ω •Squelch Flexibility: 3 methods for applying squelch		−55 to +125	−65 to +200	±3	For $T_A \leq 25°C$ $P_T = 1W$ For $T_A > 25°C$ derate 6.7mW/°C With Heat Sink For $T_C \leq 55°C$ $P_T = 2W$ For $T_C > 55°C$ derate 16mW/°C	
CA3020A	The CA3020A is like the CA3020 except for the following: Power Output Class B Amplifier— CA3020 (V_{CC} = 9V) = 0.55mW typ. CA3020A (V_{CC} = 12V) = 1mW typ. Sensitivity— CA3020 (400mW) = 35mV typ. CA3020A (800mW) = 50mV typ.						

Typical Electrical Characteristics at $T_A = 25°C$

DC Supply Voltages		Static						Dynamic							
					Device Gain•			Noise Figure			Input and Output Impedance				
V_{EE} V	V_{CC} V	Input Offset Voltage mV	Input Bias Current μA	DC Input Power Drain mW	Test Freq. MHz	Gain dB	Useful Frequency Range MHz	Test Freq. MHz	NF dB	CMR Ratio f=1kHz dB	Test Freq. MHz	Input Ω	Output Ω	Device Pkgs See Page 3	RCA Type
Differential Amplifiers															
−6	+6	1.4	23	30	1kHz	32[a] 37[b]	DC to 30	—	—	98	1kHz	195k	8k	TO-5	**CA3000**
								Total Harmonic Distortion = 0.2% typ. at f = 1kHz							
−6	+6	1.5	16	78	1.75 20	19 14	DC to 100	1.75 11.7	5 7.7	88	1.75	140k[f] 3.4pF[f]	45	TO-5	**CA3001**
−6	+6	2.2 unbal.	20	55	1.75	24 diff.	DC to 15	1.75	4	—	1.75	100k[f] 4pF[f]	70	TO-5	**CA3002**
−6	+6	1.7	21	26	100	12[e]	DC to 120	100	6.3	98	100	1.2k	2.2k	TO-5	**CA3004**
−6	+6	2.6	19	26	100	20[c,e] 16[d,e]	DC to 120	100	7.8[c] 7.8[d]	101	100	1.4k	2k	TO-5	**CA3005**
−6	+6	0.8	19	26	100	20[c,e] 16[d,e]	DC to 120	100	7.8[c] 7.8[d]	101	100	1.4k	2k	TO-5	**CA3006**
−6	+6	0.57 unbal.	11	30	1kHz	22[e]	DC to 20kHz	—	—	77	1kHz	4k	60	TO-5	**CA3007**
								Total Harmonic Distortion = 0.28% typ. at f = 1kHz							
Ratings and Characteristics are shown under High-Gain Wide-Band Amplifiers														TO-5	**CA3020**
														TO-5	**CA3020A**
Ratings and Characteristics are shown under Transistor Arrays														TO-5	**CA3026**
0	+6	—	16.6[d]	36	100	20[c,e]	DC to 120	—	—	—	—	—	—	TO-5	**CA3028A**
0	+6	—	—	—	10.7	17[d,e]		—	—	—	—	—	—		
0	+9	—	—	—	10.7	40[c]		100	7.2[c]	—	10.7	590[c]	12.5k[c]		
0	+9	—	—	—	10.7	30[d]		100	6.7[d]	—	10.7	1400[d]	2950[d]		
−6	+6	0.98	16.6[d]	36	1kHz at R = 2kΩ	38	DC to 120	BW at −3dB = 7.3MHz		110	1kHz	5.5k	—	TO-5	**CA3028B**
								Max Output Voltage Swing = $11.5V_{p-p}$ at f = 1kHz							
−12	+12	0.89	36[d]	175	1kHz at R = 1.6kΩ	42.5	DC to 120	BW at −3dB = 8MHz		90	1kHz	3k	—		
								Max Output Voltage Swing = $23V_{p-p}$ at f = 1kHz							
High-Gain Wide-Band Amplifiers															
0	+7.5	—	—	120	1 4.5 10.7	70 67 61	100kHz to >20MHz	4.5	8.7	—	4.5	3k[f] 7pF[f]	31.5k[f] 4.2pF[f]	TO-5	**CA3011**
0	+7.5	—	—	120	1 4.5 10.7	70 67 61	100kHz to >20MHz	4.5	8.7	—	4.5	3k[f] 7pF[f]	31.5k[f] 4.2pF[f]	TO-5	**CA3012**
Ratings and Characteristics are shown under Special-Function Subsystems														TO-5	**CA3013**
														TO-5	**CA3014**
3	+9	P_{OUT} (max.) = 550mW at THD = 10%			1kHz	75	Up to 8	Signal-to-Noise Ratio, 70dB			1kHz	55k	130	TO-5	**CA3020**
0	+9	P_{OUT} (max.) = 1W at THD = 10%			1kHz	75	Up to 8	Signal-to-Noise Ratio, 66dB			1kHz	55k	200	TO-5	**CA3020A**
0	+12				1kHz	75					1kHz	55k	200		

•Voltage gain unless specified

a single-ended output
b double-ended output
c cascode circuit
d differential circuit
e Gp = Power Gain
f Parallel resistance and capacitance
g V_{CC} = +9V

RCA Type	Applications and Features	Absolute Maximum Ratings: Ambient Temperature Range, Operating °C	Ambient Temperature Range, Storage °C	Input Signal Voltage, Single Ended V	Input Signal Voltage, Common Mode V	Maximum DC Input Power P_T mW
High-Gain Wide-Band Amplifiers (cont'd)						
CA3021	**Video and Wide-Band Amplifiers** •Wide AGC Range: 33db typ •Gain-Controlled Linear Amplifiers •AM-FM IF Amplifiers •Video Amplifiers •Limiters •Only One Power Supply (4.5-C to 12-V) required Types differ in bandwidth capability and power drain •—3dB Bandwidth up to 16MHz (resistive load) •Power Drain: as low as 4 mW	−55 to +125	−65 to +200	±3	—	120
CA3022				±3	—	120
CA3023				±3	—	120
CA3035	**Multipurpose Wide-Band Amplifiers** •Three Individual General-Purpose Amplifiers •Ideal for Service in Remote-Control Amplifiers, e.g. TV Receivers •All Amplifiers Single-Ended; Only One Power Supply Required	•Exceptionally High Cascade Voltage Gain: 129dB typ at 40kHz •Low-Noise Performance •Wide-Band Response •Built-In Temperature Compensation				
CA3035V1	Identical to CA3035 but has formed leads					
CA3041	**High Gain FM IF Amplifier/Limiter/FM Detector/Driver Amplifier** •For Sound Systems of TV Receivers using Tube-Type AF Output Amplifiers					
CA3042	Unless indicated otherwise this type is like the CA3041 but is intended for Sound Systems of TV Receivers Using Transistor-Type AF Output Amplifiers.					
CA3043	**High Gain FM IF Amplifier/Limiter/FM Detector/AF Preamplifier** •For FM IF Amplifier Applications in FM Communications and					
Special-Function Subsystems						
CA3013	**FM IF Amplifier/AM and Noise Limiter/FM Detector/Audio Preamplifier** Comprehensive circuit functions in a single package •Excellent AM Rejection: >50dB at 4.5MHz •High Amplifier Gain: 75dB typ. at 4.5 MHz •Recovered AF Voltage: 220mV typ. at 4.5MHz, 25kHz deviation CA3013 is like CA3014 except for max. recommended dc supply voltage: CA3013, 7.5V; CA3014 10V •Input Limiting Voltage (at knee) = 300μV at f=4.5MHz	−55 to +125	−65 to +200	±3	—	300
CA3014		−55 to +125	−65 to +200	±3	—	300
CA3034	**Dual Phase Detector with Differential Output Amplifier** •Primarily Intended for AFC Applications •Differential Input Amplifier •Compensated Reference-Voltage Supply	−55 to +125	−65 to +200	12 p to p	—	300
CA3034V1	Identical to CA3034 but has formed leads					
CA3035	**Three Individual Multi-Purpose Wide-Band Amplifiers** •Ideal for Service in Remote-Control Amplifiers, e.g. TV Receivers •All Amplifiers Single-Ended; Only One Power Supply Required •Exceptionally High Cascade Voltage Gain: 129dB typ. at 40kHz •Low-Noise Performance •Wide-Band Response •Built-In Temperature Compensation	−55 to +125	−65 to +200	1 p to p	—	300
CA3035V1	Identical to CA3035 but has formed leads					
CA3041	**High Gain FM IF Amplifier/Limiter/FM Detector/Driver Amplifier** •For Sound Systems of TV Receivers using Tube-Type AF Output Amplifiers •For FM IF Amplifier Applications in FM Communications and High-Fidelity Receivers to 20 MHz. •High Sensitivity: Input Limiting Voltage (knee) 150μV typ. at 4.5MHz •Excellent AM Rejection: 58dB typ. at 4.5 MHz •Large Audio Drive Voltage Capability •Low Harmonic Distortion •Internal Zener-Diode Regulated Voltage Supply •Inherent High Stability: Internally Shielded •Low Harmonic Radiation	0 to +85	−25 to +85	±3	For $T_A \leq 25°C$ $P_T = 950mW$ For $T_A > 25°C$ derate 10.8mW/°C	
CA3042	Unless indicated otherwise this type is like the CA3041 but is intended for Sound Systems of TV Receivers Using Transistor-Type AF Output Amplifiers	Total Harmonic Distortion = 1.5% at f(IF) = 4.5MHz V_{OUT} (AF) = 8V(rms)				
CA3043	**High Gain FM IF Amplifier/Limiter/FM Detector/AF Preamplifier** •For FM IF Amplifier Applications in FM Communications and High-Fidelity Receivers to 20MHz •High Sensitivity: Input Limiting Voltage 50μV at 10.7MHz •Recovered AF Voltage: 100mV at 75KHz deviation •Low Harmonic Distortion	−55 to +125	−65 to +200	—	—	300
CA3044	**Dual Phase Detector with Differential Output Amplifier** •For AFC Applications •Internal Zener Regulated Power Supply •Differential Input Amplifier/Limiter •Full-Wave Diode Bridge Detector	−55 to +125	−65 to +200	—	For $T_A \leq 25°C$ $P_T = 830mW$ For $T_A > 25°C$ derate 5.6mW/°C	
CA3044V1	Identical to CA3044 but has formed leads					

For information on RCA Application Notes for Linear Circuits, see Pages 12 and 13.

Typical Electrical Characteristics at $T_A = 25°C$

DC Supply Voltages		Static			Dynamic										
					Device Gain Voltage gain unless specified										
V_{EE} V	V_{CC} V	Input Offset Voltage mV	Input Bias Current μA	DC Input Power Drain mW	Test Freq. MHz	Gain dB	Useful Frequency Range MHz	Noise Figure Test Freq. MHz	Noise Figure NF dB	Common Mode Rejection Ratio f=1kHz dB	Input and Output Impedance Test Freq. MHz	Input Ω	Output Ω	Device Pkgs See Page 3	RCA Type
High-Gain Wide-Band Amplifiers															
0	+6	—	—	4	0.5	56	DC to 6	1	4.2	—	1	4kf 11pFf	300 Resistive	TO-5	CA3021
0	+6	—	—	12.5	2.5	57	DC to 20	1	4.4	—	5	1.3kf 18pFf	120 Resistive	TO-5	CA3022
0	+6	—	—	35	5 10	53 44	DC to 40	1	6.5	—	10	300f 13pFf	100 Resistive	TO-5	CA3023
Ratings and Characteristics are shown under Special-Function Subsystems														TO-5	CA3035
Ratings and Characteristics identical to CA3035V1														TO-5	CA3035V
Ratings and Characteristics are shown under Special-Function Subsystems														DIP	CA3041
														DIP	CA3042
														TO-5	CA3043
Special-Function Subsystems															
0	+7.5	—	—	120	1 4.5 10.7	70 67 60	100kHz to >20MHz	4.5	8.7	—	4.5	3kf 7pFf	31.5kf 4.2pFf	TO-5	CA3013
0	+7.5	—	—	120	1 4.5 10.7	70 67 60	100kHz to >20MHz	4.5	8.7	—	4.5	3kf 7pFf	31.5kf 4.2pFf	TO-5	CA3014
—	+10	Total Current Drain: 9mA typ. Quiescent Operating Current into Terminal No. 2: 1.9mA typ. Reference Voltage at Terminal No. 9: 5.5V typ. Quiescent Operating Voltage at Terminal No. 4 and No. 5: 5.5V typ.							Output Offset Voltage Between Terminals No. 4 and 5: 0V typ.			2k	—	TO-5	CA3034
Ratings and Characteristics Identical to CA3034 but has formed leads.														TO-5	CA3034V1
—	+9	Total Drain: 5mA typ. Sens. 100μV at V_{CC} = +13V Relay mA=7.5	Ampl. #1	40kHz	44		−3db B-W 500kHz	1kHz	6	— Typ. Out. Volt Swing = $2V_{p-p}$	40kHz	50k	270	TO-5	CA3035
			Ampl. #2	40kHz	46		2.5	—	—	— Typ. Out. Volt. Swing = $2.6V_{p-p}$	40kHz	2k	170		
			Ampl. #3	40kHz	42		2.5	—	—	— Typ. Out. Volt. Swing = $8V_{p-p}$	40kHz	670	100k		
Ratings and Characteristics Identical to CA3035 but has formed leads.														TO-5	CA3035V1
V_{CC} = +140V to Terminal 14 thru series res. R = 6.2kΩ		—	—	250	IF Amplifier 4.5 67 AF Driver 1kHz 41		0.1 to 20	AF Amplifier Resistance at f=1kHz: Input—R_{IN} = 100kΩ Output—R_{OUT} = 30kΩ			4.5	11kf 5pFf	100kf 4pFf	14-lead DIP	CA3041
Total Harmonic Distortion = 1.5% at f(IF) = 4.5MHz; V_{OUT}(AF) = 8V(rms); Deviation = ±25kHz															
	—	—	—	240	AF Driver 1kHz 30		AF Driver Resistance at f=1kHz: Input—R_{IN} = 100kΩ Output—R_{OUT} = 250Ω							14-lead DIP	CA3042
V_{CC} = +30V thru series resistor R_L = 750Ω		Current at 6V into Pin No. 11, I_{11} = 16mA		225	10.7	80	100kHz to >20MHz	Total Harmonic Distortion = 1% at f=10.7MHz, V_{IN} = 1mV Recovered AF Voltage = 100mV			10.7	7kf 5pFf	Input Limiting Voltage at −3dB = 50μV	TO-5	CA3043
V_{CC} = +30V thru series resistor R = 1.5kΩ		Current at 9V into Pin No. 10, I_{10} = 4mA		140	Input Limiting Voltage (knee) = 75mV Input Admittance = 0.5+j1.1mmho Forward Transfer Admittance = −11.7+j10.1mmho Output Admittance = 0.077+j0.9mmho						typ values at f=45.75MHz			TO-5	CA3044
Ratings and Characteristics Identical to CA3044 but has formed leads.														TO-5	CA3044V1

f Parallel resistance and capacitance

DIP = 14-lead dual in-line plastic

Operational Amplifiers

For High-Speed Data Processing and Critical Instrumentation Equipment and Other Applications Requiring Uniform Amplification over a Wide Frequency Range
- Narrow-Band or Band-Pass Amplifiers
- DC or Video Amplifiers
- Oscillators
- Multivibrators
- Comparators
- Servo Amplifiers
- Scaling Adders
- Balanced Modulator-Drivers

RCA Type	Applications and Features	For Circuits, See Page 31	Absolute Maximum Ratings: Ambient Temp. Range, Operating °C	Ambient Temp. Range, Storage °C	Input Sig. Volt., Single Ended V	Input Sig. Volt., Common Mode V	Maximum DC Input Power, P_T mW
CA3008 **CA3008A**	•Static Power Drain: ±6V=30mW typ., ±3V=7mW typ. •Voltage Gain = 60dB typ. at ±6V •Input Offset Voltage, 1mV typ. •Output Impedance: 200Ω typ. for CA3008, 160Ω typ. for CA3008A		−55 to +125	−65 to +200	+1 −4	—	300
CA3010 **CA3010A**	•Static Power Drain: ±6V=30mW typ., ±3V=7mW typ. •Voltage Gain = 60dB typ. at ±6V •Input offset Voltage, 1mV typ. •Output Impedance: 200Ω typ. for CA3010, 160Ω typ. for CA3010A				+1 −4	—	300
CA3015 **CA3015A**	•Operate from ±3V to ±12V with good output over wide range of load impedance •Max. Output Voltage Swing at ±12V:13V_{P-P} typ. at 15kΩ; 12.5V_{P-P} typ. at 1kΩ (with R15 connected to output) •Static Power Drain: 175mW typ. at ±12V •Voltage Gain = 70dB typ. at ±12V •Max. Device Dissipation: 600mW; Max. Input Volts: —8, +1				+1 −8	—	600
CA3016 **CA3016A**					+1 −8	—	600
CA3029	The CA3029 and CA3029A are like CA3008 and CA3008A respectively, but have a 14-lead dual in-line plastic package		0 to +70	−25 to +85	+1 −4	—	300
CA3029A					+1 −4	—	300
CA3030	The CA3030 and CA3030A are like CA3015 and CA3015A respectively, but have a 14-lead dual in-line plastic package				+1 −8	—	600
CA3030A					+1 −8	—	600
CA3031/ 702A	CA3032/702C has same voltage and current ratings as CA3031/702A but has an operating temperature range of 0°C to 70°C and relaxed performance characteristics		−55 to +125	−65 to +200	+1.5 −8	—	300
CA3032/ 702C			0 to +70	−65 to +150	+1.5 −8	—	300
CA3033	•High Input Impedance: 1.5MΩ typ. for CA3033, 1MΩ typ. for CA3033A •Voltage Gain: 90dB typ. for CA3033, 96dB typ. for CA3033A •High Power Output Capability: 122mW typ. for CA3033, 255mW typ. for CA3033A •Max. Voltage Swing: 22V_{P-P} typ. for CA3033, 32V_{P-P} typ. for CA3033A		−55 to +125	−65 to +200	+10 −10	For $T_A \leq 25°C$, P_T=1.95W	
CA3033A					+10 −13	For $T_A > 25°C$, derate 14.3mW/°C	
CA3037	•Static Power Drain: ±6V=30mW typ., ±3V=7mW typ. •Voltage Gain = 60dB at ±6V •Input Offset Voltage: 1mV typ. •Output Impedance: 200Ω typ. for CA3037, 160Ω typ. for CA3037A				+1 −4	—	300
CA3037A							
CA3038 **CA3038A**	•Operate from ±3V to ±12V with good output over wide range of load impedance •Max. Output Voltage Swing at ±12V: 13V_{P-P} typ. at 15kΩ; 12.5V_{P-P} typ. at 1kΩ (with R15 connected to output) •Static Power Drain: 175mW typ. at ±12V •Voltage Gain = 70dB typ. at ±12V •Max. Device Dissipation: 600mW; Max. Input Volts: —8, +1				+1 −8	—	600

Typical Electrical Characteristics at $T_A = 25°C$

DC Supply Voltages		Static						Dynamic							
				DC	Device Gain•			Noise Figure			Input and Output Impedance				
V_{EE} V	V_{CC} V	Input Offset Voltage mV	Input Bias Current μA	Input Power Drain mW	Test Freq. MHz	Gain dB	Useful Frequency Range MHz	Test Freq. MHz	NF dB	CMR Ratio f=1kHz dB	Test Freq. 2kHz	Input Ω	Output Ω	Device Pkgs See Page 3	RCA Type
Operational Amplifiers															
−6	+6	1.08	5.3	30	1kHz	60 power gain	DC to 15	—	—	94	1	14k	200	FP	**CA3008**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
−6	+6	0.9	2.5	40	1kHz	60 power gain	DC to 15	1	8.3	94	1	20k	160	FP	**CA3008A**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
Ratings and Characteristics Identical to CA3008.														TO-5	**CA3010**
Ratings and Characteristics Identical to CA3008A.														TO-5	**CA3010A**
−12	+12	1.37	9.6	175	1kHz	70 power gain	DC to 50	—	—	103	1	7.8k	92	TO-5	**CA3015**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							
−12	+12	1	4.7	175	1kHz	70 power gain	DC to 50	1	11	103	1	10k	85	TO-5	**CA3015A**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							
Ratings and Characteristics Identical to CA3015.														FP	**CA3016**
Ratings and Characteristics Identical to CA3015A.														FP	**CA3016A**
−6	+6	1.08	5.3	30	1kHz	60	DC to 15	—	—	94	1	14k	200	DIP	**CA3029**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
−6	+6	0.9	2.5	40	1kHz	60	DC to 15	1	8.3	94	1	20k	160	DIP	**CA3029A**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
−12	+12	1.37	9.6	175	1kHz	70	DC to 50	—	—	103	1	7.8k	92	DIP	**CA3030**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							
−12	+12	1	4.7	175	1kHz	70	DC to 50	1	11	103	1	10k	85	DIP	**CA3030A**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							
−6	+12	2	3	85	1kHz	70	DC to 40	—	—	85	1	25k	130	TO-5	**CA3031/ 702A**
								Max. Out. Volt. Swing = $10V_{p-p}$ at f = 1kHz							
−6	+12	5	5	90	1kHz	70	DC to 40	—	—	80	1	20k	200	TO-5	**CA3032/ 702C**
								Max. Out. Volt. Swing = $10V_{p-p}$ at f = 1kHz							
−12	+12	2.6	83nA	120	1kHz	90	DC to 0.5	—	—	100	1	1.5M	—	DIC	**CA3033**
								Max. Out. Volt. Swing = $22V_{p-p}$ at f = 1kHz							
−18	+18	2.9	103nA	250	1kHz	96	DC to 0.5	1	6	108	1	1M	—	DIC	**CA3033A**
								Max. Out. Volt. Swing = $32V_{p-p}$ at f = 1kHz							
−6	+6	1.08	5.3	30	1kHz	60	DC to 15	—	—	94	1	14k	200	DIC	**CA3037**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
−6	+6	0.9	2.5	40	1kHz	60	DC to 15	1	8.3	94	1	20k	160	DIC	**CA3037A**
								Max. Out. Volt. Swing = $6.75V_{p-p}$ at f = 1kHz							
−12	+12	1.37	9.6	175	1kHz	70	DC to 50	—	—	103	1	7.8k	92	DIC	**CA3038**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							
−12	+12	1	4.7	175	1kHz	70	DC to 50	1	11	103	1	10k	85	DIC	**CA3038A**
								Max. Out. Volt. Swing = $14V_{p-p}$ at f = 1kHz							

DIC = Dual in-line ceramic package DIP = Dual in-line plastic package FP = 14-Lead Flat Package

•Voltage gain unless specified

Absolute Max. Ratings

RCA Type	Applications and Features	For Circuits, See Page25	Device Dissipation: Any Transistor or Diode P mW	Device Dissipation: Total Package P mW	Ambient Temp. Range: Operating °C	Ambient Temp. Range: Storage °C	Max. Ratings Each Transistor (Collector Ma=50; Diode V=—3 to +12): Collector to Emitter Voltage V_{CEO} V	Collector to Base Voltage V_{CBO} V	Emitter to Base Voltage V_{EBO} V
Diode Arrays									
CA3019	**Six Diodes on a Single Silicon Chip.** Four in "Quad" or Bridge Configuration, and Two Isolated Diodes. •Matched Diodes •Low Leakage		20	120	—55 to +125	—65 to +200	—	—	—
CA3039	**Six Independent Diodes on a Single Silicon Chip** Connected as Two Differential Amplifiers with Constant Current Sinks		20	450	—55 to +125	—65 to +200	—	—	—
Transistor Arrays									
CA3018	**Four NPN Transistors on Single Silicon Chip.** Two are Isolated with no Interconnections. Other Two Have Emitter-to-Base Interconnection for	Use as a Darlington Pair, a Common-Emitter Amplifier with a Decoupled Common-Base Amplifier, an Amplifier with Protective Diode at Input, or Two Diodes in Series Back-to-Back.	300	300	—55 to +125	—65 to +200	15	20	4
CA3018A	The CA3018A is similar to the CA3018 but features tighter control of current gain, leakage and offset	parameters, making it suitable for applications requiring premium performance.	300	300	—55 to +125	—65 to +200	15	20	5
CA3026	**Six Transistors on a Single Silicon Chip** Connected as Two Differential Amplifiers with Constant Current Sinks		300	450	—55 to +125	—65 to +200	15	20	5
CA3036	**•Two Independent Low-Noise Wide-Band Amplifier Channels** •Particularly Useful for Preamplifier and Low-Level Amplifier Applications in Single-Channel and Stereo Systems	•Wide Application in Low-Noise Instrumentation Amplifiers •Matched Transistors With Emitter-Follower Outputs •200-MHz Gain-Bandwidth Product	300	300	—55 to +125	—65 to +200	—	—	—
CA3045	**Three Isolated Transistors and One Differentially-Connected Transistor Pair**	•For all Types of Signal-Processing Systems operating from DC to VHF •Temperature Compensated Amplifiers	300	750	—55 to +125	—65 to +200	15	20	5
CA3046	The CA3046 is electrically like the CA3045 but is in a dual in-line plastic package for use in applications requiring a limited temperature range.		300	750	0 to +85	—25 to +85	15	20	5
Amplifier Arrays									
CA3035	Ratings and Characteristics are shown under Special-Function Subsystems								
CA3035V1	Identical to CA3035 but has formed leads.								

Technical Data Booklets, Associated Application Notes

A Sample copy of a Technical Data Booklet and its Associated Application Note, shown below, is available on request from Commercial Engineering, RCA Electronic Components, Bldg. GM-1, Harrison, N. J. 07029.

RCA Type	Associated Application Note No.	File No.	Description
Linear Integrated Circuits			
CA3000	ICAN-5030	121	DC Amplifier
CA3001	ICAN-5038	122	Video and Wide-Band Amplifier
CA3002	ICAN-5036	123	IF Amplifier
CA3004	ICAN-5022	124	RF Amplifier
CA3005	ICAN-5022	125	RF Amplifier
CA3006	ICAN-5269	125	RF Amplifier
CA3007	ICAN-5037	126	AF Amplifier
CA3008		316	Operational Amplifier
CA3008A	ICAN-5015	310	Operational Amplifier
CA3010	ICAN-5290	316	Operational Amplifier
CA3010A		310	Operational Amplifier
CA3011		128	FM IF Amplifier
CA3012	ICAN-5269	128	FM IF Amplifier
CA3013	ICAN-5380	129	FM IF Amplifier/Discriminator/AF Amplifier
CA3014		129	FM IF Amplifier/Discriminator/AF Amplifier
CA3015		316	Operational Amplifier
CA3015A	ICAN-5015 ICAN-5213	310	Operational Amplifier
CA3016	ICAN-5290	316	Operational Amplifier
CA3016A		310	Operational Amplifier
CA3018	ICAN-5296	338	Transistor Array
CA3018A	ICAN-5290		Transistor Array
CA3019	ICAN-5299	236	Diode Array
CA3020	ICAN-5766	339	Multipurpose Wide-Band Amplifier
CA3020A			Multipurpose Wide-Band Amplifier
CA3021	ICAN-5338	243	Video and Wide-Band Amplifier
CA3022		243	Video and Wide-Band Amplifier
CA3023		243	Video and Wide-Band Amplifier
CA3026			Dual Differential/Cascode Amplifier
CA3028A	ICAN-5337	327	Differential/Cascode Amplifier
CA3028B		327	Differential/Cascode Amplifier
CA3029	ICAN-5015 ICAN-5213	316	Operational Amplifier
CA3029A		310	Operational Amplifier
CA3030	ICAN-5290	316	Operational Amplifier
CA3030A		310	Operational Amplifier
CA3031/702A	ICAN-5290	241	Operational Amplifier
CA3032/702C		241	Operational Amplifier
CA3033	ICAN-5641	317	Operational Amplifier
CA3033A		317	Operational Amplifier
CA3034		273	High-Freq. Wide-Band Amp/Phase Detector
CA3034V1		273	High-Freq. Wide-Band Amp/Phase Detector
CA3035	ST-3470	274	Ultra-High-Gain Wide-Band Amp. Array
CA3035V1		274	Ultra-High-Gain Wide-Band Amp. Array
CA3036		275	Dual Darlington Array
CA3037	ICAN-5015 ICAN-5213	316	Operational Amplifier
CA3037A		310	Operational Amplifier
CA3038	ICAN-5290	316	Operational Amplifier
CA3038A		310	Operational Amplifier
CA3039			Diode Array

Electrical Characteristics at $T_A = 25°C$

Static			Dynamic					
Typical Static Forward-Current Transfer Ratio h_{FE}	Min. Collector -Substrate Breakdown Voltage V	Max. Collector Cutoff Current I_{CBO} μA	Typical h_{fe}	Typical Gain Bandwidth Product f_T MHz	Typical Open Circuit Output Cap. C_{cbo} pF	Typical Open Circuit Input Cap. C_{ebo} pF	Device Package See Page 3	RCA Type
Diode Arrays								
Typ. DC Forward Voltage Drop, 0.73V Min. DC Reverse Breakdown Voltage: any Diode, 4V; any Diode & Substrate,	25V		Max. DC Reverse Leakage Current: any Diode, 10μA; any Diode & Substrate, 10μA Typ. Single Diode Capacitance: 1.8pF				TO-5	**CA3019**
Typ. DC Forward Voltage Drop, 0.73V Min. DC Reverse Breakdown Voltage: any Diode, 5V; any Diode & Substrate,	20V		Max. DC Reverse Leakage Current: any Diode, 0.1μA; any Diode & Substrate, 1μA Typ. Single Diode Capacitance, 0.6pF				TO-5	**CA3039**
Transistor Arrays								
100(Q_1 or Q_2) 5400(Ttl. Q_3&Q_4)	20	0.1	110 f=1kHz	500	0.58	0.6	TO-5	**CA3018**
100(Q_1 or Q_2) 5400(Ttl. Q_3&Q_4)	40	0.04	110 f=1kHz	500	0.58	0.6	TO-5	**CA3018A**
100 (Each Transistor)	20	0.1	110 f=1kHz	550 Max. Input-Offset Voltage, ±5mV Max. Input-Offset Current, ±2μA	—	—	TO-5	**CA3026**
The following ratings apply for each transistor in the device: Collector-to-Emitter Voltage, V_{CEO} . . . . 15 max. V Collector-to-Base Voltage, V_{CBO} . . . . . 30 max. V Emitter-to-Base Voltage, V_{EBO} . . . . . 5 max. V Collector Current, I_C . . . . . 50 max. mA				For Either Darlington Pair: Power Gain = 47dB at 1kHz Noise Voltage = $\frac{0.05\mu V(rms)}{\sqrt{f(Hz)}}$			TO-5	**CA3036**
100(Q_1 or Q_2)	20	0.04	110 f=1kHz	550	0.58	0.6	DIC	**CA3045**
100(Q_1 or Q_2)	20	0.04	110 f=1kHz	550	0.58	0.6	DIP	**CA3046**
Amplifier Arrays								
Ratings and Characteristics are shown under Special-Function Subsystems								**CA3035**
Ratings and Characteristics Identical to CA3035								**CA3035V1**

DIC = Dual in-line ceramic package DIP = Dual in-line plastic package

1CE-338 Mounting and Connection Techniques for RCA Integrated Circuits
Discusses various methods for mounting and connecting RCA Integrated Circuits and the principal considerations involved in each method.

RCA Type	Associated Application Note No.	File No.	Description
Linear Integrated Circuits (Continued)			
CA3041	ICAN-5765	318	Wide-Band Amp, FM Detector, AF Preamp/Driver
CA3042		319	Wide-Band Amp, FM Detector, AF Preamp/Driver
CA3043		331	High-Gain IF Amplifier, Limiter, FM Detector, AM Preamplifier/Driver
CA3044		340	High-Freq. Wide-Band Amplifier/ Phase Detector
CA3044V1			High-Freq. Wide-Band Amplifier/ Phase Detector
CA3045		341	Transistor Array
CA3046			Transistor Array
Digital Integrated Circuits			
CD2100		130	High-Speed ECCSL Dual 4-Input OR/NOR Gate
CD2101		130	High-Speed ECCSL Quadruple 2-Input NOR Gate
CD2150	ICAN-5025	308	Ultra-High-Speed ECCSL Dual 4-Input OR/NOR Gate
CD2151		308	Ultra-High-Speed ECCSL Dual 4-Input OR/NOR Gate (with "wired" OR)
CD2152		308	Ultra-High-Speed ECCSL 8-Input OR/NOR Gate (with "wired" OR)
CD2153		308	Ultra-High-Speed ECCSL Quadruple Two-Input NOR Gate (with "wired" OR)
CD2200	ICAN-5271	132	Low-Power DTL Dual 4-Input NAND Gate
CD2200D		307	Ceramic Dual In-Line Package
CD2201		132	Low-Power DTL Quadruple 2-Input NAND Gate
CD2201D		307	Ceramic Dual In-Line Package
CD2202		227	Low-Power DTL Dual 4-Input NAND Buffer Gate
CD2202D		307	Ceramic Dual In-Line Package
CD2203	ICAN-5271	133	Low-Power DTL Clocked Set-Reset Flip-Flop with J-K Capability
CD2203D		307	Ceramic Dual In-Line Package
CD2204		226	Low-Power DTL Dual 4-Input NAND Gate Expander
CD2204D		307	Ceramic Dual In-Line Package
CD2205		233	Low-Power DTL Dual 3-Input Gate (with "wired" OR)
CD2205D		307	Ceramic Dual In-Line Package
CD2300 Series		332	Medium-Power DTL Circuits in ceramic 14-Lead Flat Pack
CD2300D Series		332	Medium-Power DTL Circuits in ceramic dual In-line package
CD2300E Series		332	Medium-Power DTL Circuits in silicone dual In-line package
Complementary "N" and "P" Channel MOS			
TA5361	ICAN-5593	—	Dual NOR Gate Plus Inverter
TA5362		—	Dual D-Type Flip-Flop
TA5385		—	Seven-Stage Ripple Counter
TA5388		—	Dual Complementary Pair Plus Inverter
TA5406		—	16-Bit Non-Destructive Readout Memory
TA5455		—	Quad 2-Input NOR Gate
TA5456		—	Dual 4-Input NOR Gate
TA5459		—	18-Bit Shift Register
Flat-Pack Carriers			
CX3300		134	RCA Integrated Circuit Carriers for 14-Terminal "Flat-Packaged" Integrated Circuits
CX3301		134	

RCA digital integrated circuits

Quick-Selection Chart

Logic Function	Description: Medium-Power DTL			Low-Power DTL		Ultra-High-Speed ECCSL▲	High-Speed ECCSL▲	COS/MOS*
Operating Temp.:	−55 to +125°C		0 to +75°C	−55 to +125°C		+10 to +60°C	−55 to +125°C	−55 to +125°C
Package:	14-lead ceramic flat pack	14-lead ceramic dual in-line	14-lead plastic dual in-line	14-lead ceramic flat pack	14-lead ceramic dual in-line	14-lead ceramic flat pack	14-lead ceramic flat pack	14-lead ceramic dual in-line
Gates								
Single 8-Input								
OR/NOR Complementary Outputs	—	—	—	—	—	CD2152	—	—
Dual 3-Input								
Expandable AND/OR/NOT								
Transistor Output Pull-up	—	—	—	CD2205	CD2205D	—	—	—
NOR and Inverter	—	—	—	—	—	—	—	TA5361♦
Dual 4-Input								
OR/NOR Complementary Outputs	—	—	—	—	—	CD2150, CD2151•	CD2100	—
Expandable NAND								
Transistor Output Pull-up	—	—	—	CD2200	CD2200D	—	—	—
6kΩ Output Pull-up	CD2300/930	CD2300D/930	CD2300E/830	—	—	—	—	—
2kΩ Output Pull-up	CD2301/961	CD2301D/961	CD2301E/861	—	—	—	—	—
High Fanout								
Transistor Output Pull-up	CD2306/932	CD2306D/932	CD2306E/832	CD2202	CD2202D	—	—	—
"Wired OR"								
Output Capability	CD2307/944	CD2307D/944	CD2307E/844	—	—	—	—	
NOR	—	—	—	—	—	—	—	TA5456♦
Triple 3-Input								
NAND								
6kΩ Output Pull-up	CD2308/962	CD2308D/962	CD2308E/862	—	—	—	—	—
2kΩOutput Pull-up	CD2309/963	CD2309D/963	CD2309E/863	—	—	—	—	—
Quadruple 2-Input								
NAND								
Transistor Output Pull-up	—	—	—	CD2201	CD2201D	—	—	—
6kΩ Output Pull-up	CD2302/946	CD2302D/946	CD2302E/846	—	—	—	—	—
2kΩ Output Pull-up	CD2303/949	CD2303D/949	CD2303E/849	—	—	—	—	—
NOR	—	—	—	—	—	CD2153•	CD2101	TA5455♦

▲ECCSL—Emitter-coupled current-steered logic, pronounced "EXCEL"

•"WIRED-OR" output capability

*Complementary-Symmetry MOS

♦ Anticipated Commercial Announcement, August 1968.

■ Anticipated Commercial Announcement, late in 1968.

Logic Function	Description: Medium-Power DTL			Low-Power DTL		Ultra-High-Speed ECCSL▲	High-Speed ECCSL▲	COS/MOS*
	Operating Temp.: −55 to +125°C		0 to +75°C	−55 to +125°C		+10 to +60°C	−55 to +125°C	−55 to +125°C
	Package: 14-lead ceramic flat pack	14-lead ceramic dual in-line	14-lead plastic dual in-line	14-lead ceramic flat pack	14-lead ceramic dual in-line	14-lead ceramic flat pack	14-lead ceramic flat pack	14-lead ceramic dual in-line
Hex Inverters								
Diode Input								
6kΩ Output Pull-up	CD2310/936	CD2310D/936	CD2310E/836	—	—	—	—	—
2k ΩOutput Pull-up	CD2311/937	CD2311D/937	CD2311E/837	—	—	—	—	—
Expandable Input								
6kΩ Output Pull-up	CD2312	CD2312D	CD2312E	—	—	—	—	—
2kΩ Output Pull-up	CD2313	CD2313D	CD2313E	—	—	—	—	—
Gate Expanders								
Dual 4-Diode Input	CD2314/933	CD2314D/933	CD2314E/833	CD2204	CD2204D	—	—	—
Flip-Flops								
J-K 2 Set, 2 Reset, 2J, 2K, Split Clock Inputs	—	—	—	CD2203	CD2203D	—	—	—
Clocked R-S								
J-K Capability								
6kΩ Output Pull-up	CD2304/945	CD2304D/945	CD2304E/845	—	—	—	—	—
2kΩ Output Pull-up	CD2305/948	CD2305D/948	CD2305E/848	—	—	—	—	—
Dual D	—	—	—	—	—	—	—	TA5362♦
MSI (Medium-Scale Integration)								
7-Stage Ripple Counter	—	—	—	—	—	—	—	TA5385♦ (TO-5 pkg.)
16-Bit NDRO Memory Cell	—	—	—	—	—	—	—	TA5406♦
18-Bit Static Shift Register	—	—	—	—	—	—	—	TA5459■
General Purpose								
Dual Complementary Pair Plus Inverter	—	—	—	—	—	—	—	TA5388♦

Medium-Power DTL

Absolute Maximum Ratings at $T_A = 25°C$

RCA Type	Description For Circuits, See Page 26	Features	Power Supply Voltage V	Input Current Forward mA	Input Current Reverse mA	Output Current (into output) mA	Ambient Temperature Range Operating °C	Ambient Temperature Range Storage °C
Dual Four-Input Gates								
CD2300/930	Expandable NAND Gate with 6kΩ output pull-up	• Average power dissipation (per gate) :8mW typical • Average gate propagation delay :25ns typical (fan-out = 7+35pF) • Gate fan-out capability—"pull-up" resistor = 6kΩ . . . . . 8 = 2kΩ . . . . . 7 • High Fan-out Gate drive capability:25 • Noise immunity :1V typical at 25°C • "Wired-OR" output logic capability • Single 4.5V to 5.5V power supply	8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2300D/930								
CD2300E/830							0 to +75	−25 to +85
CD2301/961	Expandable NAND Gate with 2kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2301D/961								
CD2301E/861							0 to +75	−25 to +85
CD2306/932	Expandable NAND High Fanout Gate		8 12[a]	−10	1	150	−55 to +125	−65 to +150
CD2306D/932								
CD2306E/832							0 to +75	−25 to +85
CD2307/944	Expandable NAND High Fanout Gate with "Wired-OR"		8 12[a]	−10	1	150	−55 to +125	−65 to +150
CD2307D/944								
CD2307E/844							0 to +75	−25 to +85
Triple Three-Input Gates								
CD2308/962	NAND Gate with 6kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2308D/962								
CD2308E/862							0 to +75	−25 to +85
CD2309/963	NAND Gate with 2kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2309D/963								
CD2309E/863							0 to +75	−25 to +85
Quadruple Two-Input Gates								
CD2302/946	NAND Gate with 6kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2302D/946								
CD2302E/846							0 to +75	−25 to +85
CD2303/949	NAND Gate with 2kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2303D/949								
CD2303E/849							0 to +75	−25 to +85
Hex Inverters								
CD2310/936	Diode Input with 6kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2310D/936								
CD2310E/836							0 to +75	−25 to +85
CD2311/937	Diode Input with 2kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2311D/937								
CD2311E/837							0 to +75	−25 to +85
CD2312	Expandable Input with 6kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2312D								
CD2312E							0 to +75	−25 to +85
CD2313	Expandable Input with 2kΩ output pull-up		8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2313D								
CD2313E							0 to +75	−25 to +85
Dual Four-Diode Input Expander								
CD2314/933			8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2314D/933								
CD2314E/933							0 to +75	−25 to +85

[a] Pulsed; duration less than one second

Electrical Characteristics at $T_A = 25°C$

Output Voltage		Input Current		Output Current			Max. Power Supply Current Drain	Propagation Delay				Device Package See Page 3	RCA Type
"Low" V	"High" V	Reverse μA	Forward mA	Leakage μA	Short Circuit mA			($t_{pd}-$)ns		($t_{pd}+$)ns			
max	min	max	max	max	min	max	mA	min	max	min	max		
Dual Four-Input Gates													
0.4	2.6	2	−1.6	50	−0.61	−1.34	6.5	10	30	25	80	CFP	CD2300/930
												CDL	CD2300D/930
0.45	2.6	5	−1.4	100	−0.61	−1.3	8	10	30	25	80	PDL	CD2300E/830
0.4	3.8	2	−1.6	50	−2.1	−3.7	10.9	10	30	15	50	CFP	CD2301/961
												CDL	CD2301D/961
0.45	4.3	5	−1.4	100	−1.85	−3.68	11.8	10	30	15	50	PDL	CD2301E/861
0.4	2.6	2	−1.6	50	−18	—	26.6	15	40	25	80	CFP	CD2306/932
												CDL	CD2306D/932
0.45	2.6	5	−1.4	100	−16	—	30	15	40	25	80	PDL	CD2306E/832
0.4	6[b]	2	−1.6	100	—	—	20	10	35	15	50	CFP	CD2307/944
												CDL	CD2307D/944
0.45	6[b]	5	−1.4	100	—	—	22.5	10	35	15	50	PDL	CD2307E/844
Triple Three-Input Gates													
0.4	2.6	2	−1.6	50	−0.61	−1.34	9.75	10	30	25	80	CFP	CD2308/962
												CDL	CD2308D/962
0.45	2.6	5	−1.4	100	−0.61	−1.3	12	10	30	25	80	PDL	CD2308E/862
0.4	3.8	2	−1.6	50	−2.1	−3.7	16.35	10	30	15	50	CFP	CD2309/963
												CDL	CD2309D/963
0.45	4.3	5	−1.4	100	−1.85	−3.68	17.7	10	30	15	50	PDL	CD2309E/863
Quadruple Two-Input Gates													
0.4	2.6	2	−1.6	50	−0.61	−1.34	13	10	30	25	80	CFP	CD2302/946
												CDL	CD2302D/946
0.45	2.6	5	−1.4	100	−0.61	−1.3	16	10	30	25	80	PDL	CD2302E/846
0.4	3.8	2	−1.6	50	−2.1	−3.7	4.8	10	30	15	50	CFP	CD2303/949
												CDL	CD2303D/949
0.45	4.3	5	−1.4	100	−1.85	−3.68	23.6	10	30	15	50	PDL	CD2303E/849
Hex Inverters													
0.4	2.6	2	−1.6	50	−0.61	−1.34	19.5	10	30	25	80	CFP	CD2310/936
												CDL	CD2310D/936
0.45	2.6	5	−1.4	100	−0.61	−1.3	24	10	30	25	80	PDL	CD2310E/836
0.4	3.8	2	−1.6	50	−2.1	−3.7	32.7	10	30	15	50	CFP	CD2311/937
												CDL	CD2311D/937
0.5	4.3	5	−1.4	100	−1.85	−3.68	35.4	10	30	15	50	PDL	CD2311E/837
0.4	2.6	—	−1.6	50	−0.61	−1.34	19.5	10	30	25	80	CFP	CD2312
												CDL	CD2312D
0.45	2.6	—	−1.4	100	−0.61	−1.3	24	10	30	25	80	PDL	CD2312E
0.4	3.8	—	−1.6	50	−2.1	−3.7	32.7	10	30	15	50	CFP	CD2313
												CDL	CD2313D
0.5	4.3	—	−1.4	100	−1.85	−3.68	35.4	10	30	15	50	PDL	CD2313E

Dual Four-Diode Input Expander

Input For. Volt. per Diode		Current per Diode	Current per Expander		
0.7V min	0.82V max	2μA max	10μA max	CFP	CD2314/933
0.68V min	0.84V max	5μA max	25μA max	CDL	CD2314D/933
				PDL	CD2314E/833

[b] Output Breakdown Voltage CFP—14-lead ceramic flat pack CDL—14-lead ceramic dual-in-line package PDL—14-lead plastic dual-in-line package

Medium-Power DTL (Continued)

Absolute Maximum Ratings at $T_A = 25°C$

RCA Type	Description For Circuits, See Page 26	Features	Power Supply Voltage V	Input Current Forward mA	Input Current Reverse mA	Output Current (into output) mA	Ambient Temperature Range Operating °C	Ambient Temperature Range Storage °C
Clocked R-S Flip-Flops								
CD2304/945	J-K Capability with 6kΩ output pull-up	• Average power dissipation (per gate) :8mW typical • Average gate propagation delay :25ns typical (fan-out = 7+35pF) • Gate fan-out capability—"pull-up" resistor = 6kΩ.....8 = 2kΩ.....7	8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2304D/945								
CD2304E/845							0 to +75	−25 to +85
CD2305/948	J-K Capability with 2kΩ output pull-up	• High Fan-out Gate drive capability:25 • Noise immunity :1V typical at 25°C • "Wired-OR" output logic capability • Single 4.5V to 5.5V power supply	8 12[a]	−10	1	30	−55 to +125	−65 to +150
CD2305D/948								
CD2305E/848							0 to +75	−25 to +85

[a] Pulsed; duration less than one second

Maximum Ratings

RCA Type	Description For Circuits, See Page 28	Features	Ambient Temp. Range Operating °C	Ambient Temp. Range Storage °C	DC Supply Voltage Range V
Low-Power DTL					
CD2200	Dual Four-Input Expandable NAND Gate	▪ Very low dissipation: 2.3mW/gate, 7mW/flip-flop ▪ Military full-temperature range: −55°C to +125°C ▪ High noise immunity: 1.2V typ. at 25°C ▪ Active pull-up outputs—afford low impedance for driving high capacitive loads ▪ High breakdown voltage input "Diodes" ▪ Popular pin configuration: 14 = V_{CC}, 7 = Ground ▪ Monolithic silicon epitaxial construction ▪ Aluminum-to-aluminum ultrasonic bonding ▪ CD2202: Buffer Gate. Capable of Fan-Out of 25 + 250 pF ▪ CD2203: Split Clock Lines. Dual "J" Clock Steering Inputs. Dual "K"Clock Steering Inputs.Dual DC Set and Reset Inputs. 3MHz Complementing Rate ▪ CD2204: Capable of expanding fan-in to more than 20• Compatible in all respects with inputs of CD2200-Series gates ▪ CD2205: Performs AND/OR/NOT function. Expandable "AND" Sections ▪ "D" Suffix:"D"Series are electrically identical with flat-pack versions, but utilize a 14-lead dual in-line ceramic package	−55 to +125	−65 to +150	+3.8 to +6.3
CD2200D								
CD2201	Quadruple Two-Input NAND Gate		−55 to +125	−65 to +150	+3.8 to +6.3
CD2201D								
CD2202	Dual Four-Input Expandable NAND Buffer Gate		−55 to +125	−65 to +150	+3.8 to +6.3
CD2202D								
CD2203	J-K Flip-Flop		−55 to +125	−65 to +150	+3.8 to +6.3
CD2203D								
CD2204	Dual Four-Input Gate Expander		−55 to +125	−65 to +150	0 to +6.3
CD2204D								
CD2205	Dual Three-Input Expandable AND/OR/NOT Gate		−55 to +125	−65 to +150	+3.8 to +6.3
CD2205D								
Ultra-High-Speed ECCSL•					
CD2150	Dual Four-Input OR/NOR Gate	▪ Exceptionally high speed—Non-saturated operation ▪ High system noise immunity—40% of logic swing ▪ Integral reference voltage supply ▪ Constant power supply current ▪ Drives 100Ω terminated lines ▪ Complementary OR/NOR outputs ▪ "Wired-OR" output capability	+10 to +60	−55 to +150	−4.5 to −5.5
CD2151	Dual Four-Input OR/NOR Gate with "Wired-OR"		+10 to +60	−55 to +150	−4.5 to −5.5
CD2152	Eight-Input OR/NOR Gate with "Wired-OR"		+10 to +60	−55 to +150	−4.5 to −5.5
CD2153	Quadruple Two-Input NOR Gate with "Wired-OR"		+10 to +60	−55 to +150	−4.5 to −5.5
High-Speed ECCSL•					
CD2100	Dual Four-Input OR/NOR Gate	▪ High speed—Non-saturated operation ▪ Military full-temperature range: −55°C to +125°C ▪ High system noise immunity—40% of logic swing ▪ Integral reference voltage supply ▪ Constant power supply current	−55 to +125	−65 to +150	−4.68 to −5.72
CD2101	Quadruple Two-Input NOR Gate		−55 to +125	−65 to +150	−4.68 to −5.72

• Emitter-coupled, current-steered logic (ECCSL), pronounced "EXCEL."

Electrical Characteristics at $T_A = 25°C$

Output Voltage		Input Current		Output Current			Max. Power Supply Current Drain	Propagation Delay				Device Package See Page 3	RCA Type
"Low" V	"High" V	Reverse μA	Forward mA	Leakage μA	Short Circuit mA			(t_{pd}—)ns		(t_{pd}+)ns			
max	min	max	max	max	min	max	mA	min	max	min	max		
Clocked R-S Flip-Flops													
0.4	2.6	2	−1.07	50	−0.61	−1.34	14	30	75	35	75	CFP	CD2304/945
		2	−2.4									CDL	CD2304D/945
		10	−3.2										
0.45	2.6	5	−0.95	100	−0.61	−1.3	15	30	75	35	75	PDL	CD2304E/845
		5	−2.1										
		20	−2.8										
0.4	3.8	2	−1.07	50	−2.1	−3.7	16.2	30	75	30	65	CFP	CD2305/948
		2	−2.4									CDL	CD2305D/948
		10	−2.56										
0.45	4.3	5	−0.95	100	−1.85	−3.68	17.5	30	75	30	65	PDL	CD2305E/848
		5	−2.1										
		20	−2.24										

CFP—14-lead ceramic flat pack CDL—14-lead ceramic dual-in-line package PDL—14-lead plastic dual-in-line package

Electrical Characteristics at $T_A = 25°C$

Operating Conditions	Static							Dynamic		Appl. Note No.	Device Package See Page 3	RCA Type
								Prop. Delay Time				
Maximum Fan-Out Per Gate	V_{CC} V	V_{EE} V	Typ. Logic Levels "0" V	Typ. Logic Levels "1" V	Max. DC Input Current mA	Typ. Device Dissipation mW	Typ. Noise Immunity V	Average ns	Fan-Out Loads+ Cap. (N+pF)			
Low-Power DTL												
6	+4	0	+0.1	+3.4	−0.33	2.3 per gate	1.2	55	6+60	ICAN 5271	types with "D" suffix have 14-lead dual in-line ceramic pkg.; other types have 14-lead flat pkg.	CD2200
												CD2200D
6	+4	0	+0.1	+3.4	−0.33	2.3 per gate	1.2	55	6+60	ICAN 5271		CD2201
												CD2201D
25	+4	0	+0.1	+3.4	−0.33	12 per gate	1.2	48	25+250	ICAN 5271		CD2202
												CD2202D
5	+4	0	+0.1	+3.4	−0.33	7 per pkg.	1.2	130	5+50	ICAN 5271		CD2203
												CD2203D
For input expansion of CD2200, CD2202, and CD2205 gates	capable of expanding fan-in to more than 20 forward voltage, 0.72V typ.					low capacitive loading on expanded gate, 4pF typ. leakage current, 5nA typ.				ICAN 5271		CD2204
												CD2204D
—	+4	0	+0.1	+3.4	−0.33	5 per pkg.	1.2	71	6+60	ICAN 5271		CD2205
												CD2205D
Ultra-High-Speed ECCSL•												
12 (unterminated) 6 (100-Ω termination)	0	−5	−1.6 outputs unloaded	−0.76	0.186	220 per pkg.	0.35	3.6 7.3	1+10 6+60	ICAN 5025	14-lead flat pkg.	CD2150
12 (unterminated) 6 (100-Ω termination)	0	−5	−1.6 outputs unloaded	−0.76	0.186	175 per pkg.	0.35	3.6 7.3	1+10 6+60	ICAN 5025		CD2151
12 (unterminated) 6 (100-Ω termination)	0	−5	−1.6 outputs unloaded	−0.76	0.186	147 per pkg.	0.35	3.6 7.3	1+10 6+60	ICAN 5025		CD2152
12 (unterminated) 6 (100-Ω termination)	0	−5	−1.6 outputs unloaded	−0.76	0.186	175 per pkg.	0.35	3.6 7.3	1+10 6+60	ICAN 5025		CD2153
High-Speed ECCSL•												
12 (unterminated) 6 (300-Ω termination)	0	−5.2	−1.55 outputs unloaded	−0.75	0.1	88 per pkg.	0.32	6 24	1+10 6+60	ICAN 5025	14-lead flat pkg.	CD2100
12 (unterminated) 6 (300-Ω termination)	0	−5.2	−1.55 outputs unloaded	−0.75	0.1	120 per pkg.	0.32	6 24	1+10 6+60	ICAN 5025		CD2101

RCA digital integrated circuits

COS/MOS

Complementary-Symmetry MOS

RCA Type	Description (For Circuits, See Page 33)	Applications and Features	Absolute Maximum Ratings: Temperature Range, Operating °C	Temperature Range, Storage °C	DC Supply Voltage Range V_{DD} to V_{SS} V	DC Current Drain mA	Input Voltage (V_{IN}) V
Gates							
TA5361†	Dual 3-Input NOR Gate plus Inverter	▪ Large fanout capability ▪ V_{SS} to V_{DD} logic swing ▪ $10^{12}\Omega$ input resistance ▪ Nanowatt quiescent power dissipation ▪ Operation from single positive or negative power supply ▪ Full military operating temperature range: —55°C to +125°C ▪ Hermetically sealed 14-lead dual in-line ceramic and metal package ▪ High-Speed operation $t_{pd}(av)$ = 50ns (typ)	—55 to +125	—65 to +125	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
TA5455†	Quad 2-Input NOR Gate		—55 to +125	—65 to +125	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
TA5456†	Dual 4-Input NOR Gate		—55 to +125	—65 to +125	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
Flip-Flop							
TA5362†	Dual D-Type	▪ Master-Slave F/F ▪ DC reset capability ▪ High-Speed operation: 4MHz	—55 to +125	—65 to +150	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
MSI (Medium-Scale Integration)							
TA5385†	Seven-Stage Ripple Counter/Frequency Divider	▪ High-speed operation: to 8MHz ▪ Reset input	—55 to +125	—65 to +150	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
TA5406†	16-Bit Non-Destructive Readout (NDRO) Memory	▪ 15ns readout delay time (bipolar amplifier current sensing)	—55 to +125	—65 to +150	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$
TA5459★	18-Bit Shift Register	▪ Permanent register storage; no data recirculation required	—55 to +125	—65 to +150	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$

General Purpose

RCA Type	Description (For Circuits, See Page 33)	Applications and Features	Absolute Maximum Ratings: Temperature Range, Operating °C	Temperature Range, Storage °C	DC Supply Voltage Range V_{DD} to V_{SS} V	DC Current Drain mA	Input Voltage (V_{IN}) V
TA5388†	Dual Complementary Pair plus Inverter	▪ High-speed operation: tpd(av) = 35ns ▪ Other applications and features are shown above.	—55 to +125	—65 to +150	15	10	$V_{SS} \leq V_{IN} \leq V_{DD}$

†Developmental Type, Anticipated Commercial Announcement, August 1968

★Developmental Type, Anticipated Commercial Announcement, late in 1968

Typical Electrical Characteristics at $T_A = 25°C$

Operating Voltage		Logic Levels		DC Input Current		Device Dissipation (quiescent)		Noise Immunity 40% of V_{DD}	Input Capacitance		Propagation Delay Time		Device Package See Page 3	RCA Type
V_{DD} V	V_{SS} V	V_{OUT} "0" V	V_{OUT} "1" V	V_{IN} = OV pA	V_{IN} = 10V pA	V_{IN} = OV nW	V_{IN} = 10V nW	V	Per Gate pF	Inverter pF	t_{pd} "0" ns	t_{pd} "1" ns		
Gates														
+10	0	0.01	9.99	10	10	10	10	4	2.5	1.5	65	70 at C_L=30pF	14-lead dual in-line ceramic	TA5361
+10	0	0.01	9.99	10	10	10	10	4	2.5	—	65	70 at C_L=30pF	14-lead dual in-line ceramic	TA5455
+10	0	0.01	9.99	10	10	10	10	4	2.5	—	65	70 at C_L=30pF	14-lead dual in-line ceramic	TA5456
Flip-Flop														
+10	0	0.01	9.99	10	10	10	10	4	5-Data Input Term. 8.5-Reset Term. 5-Clock Input Term.		90	90	14-lead dual in-line ceramic	TA5362
Dynamic Device Dissipation at 100kHz=0.4mW (typ.)				"0" and "1" Clock-Pulse Duration = 125ns (min.)					Clock-Pulse Input Frequency = 4MHz (max.)					
MSI (Medium-Scale Integration)														
+10	0	0.01	9.99	10	10	100		4	5-Input Pulse 40-Reset Input		150	150	TO-5	TA5385
Dynamic Device Dissipation at 100kHz=0.4mW (typ.)				"0" and "1" Clock-Pulse Duration = 125ns (min.)					Clock-Pulse Input Frequency = 4MHz (max.)					
+10	0	DC Sense Current: "0"=10μA "1"=500μA		10	10	100		—	20—x, y, D, and Sense Line		"1" Sense Read Time = 15ns Write Pulse Width = 50ns		14-lead dual in-line ceramic	TA5406
+10	0	0.01	9.99	10	10	100		4	5-D Line 50-Clock Line		150	200 at C_L=50pF Clock Pulse Freq. (shift rate)=2MHz (max.)	14-lead dual in-line ceramic	TA5459

General Purpose

Typical Electrical Characteristics at $T_A = 25°C$

DC Transconductance (g_{fs})		Gate Threshold Voltage		Drain-Source Leakage Current (I_{DSS})		Drain-Source Breakdown Voltage [$V_{(BR)DSS}$]		Input Capacitance	Device Package See Page 3	RCA Type
"N" Channel μmho	"P" Channel μmho	"N" Channel V	"P" Channel V	"N" Channel μA	"P" Channel μA	"N" Channel V	"P" Channel V	pF		
200 (min)	200	+1.5	−3	1	1	15	15	5	14-lead dual in-line ceramic	TA5388

Integrated-Circuit Sockets

The table below lists some commercially available sockets for integrated circuits by manufacturers' and/or suppliers' parts numbers. This list is based on manufacturers' and/or suppliers' published information in our files at the time this publication was printed, and is not necessarily complete. Sockets having mechanical and electrical characteristics comparable with those of the devices listed below may be available from other manufacturers and/or suppliers of electronic components.

For a discussion of various methods for mounting and connecting RCA Integrated Circuits in equipment, and the principal considerations involved in each method, refer to RCA Technical Bulletin ICE-338 "Mounting and Connection Techniques for RCA Integrated Circuits."

Integrated-Circuit Package Type	Mfr. or Supplier	Mfr's. or Supplier's Part No.	Description
14-Lead Flat Package	AMP Inc.	583109-0 thru 7▲	Header (requires crimping machine)
		583110-0 thru 7▲	Receptacle
	Azimuth Electronics	5100-2	For use at temperatures up to 200°C
	Barnes Corporation	MD-55	For use at temperatures up to 125°C
		MD-75	For use at temperatures up to 200°C
	Jettron Products, Inc.	71-062	—
		71-005	Plug-in printed-circuit card
14-Lead Flat Package in RCA Carrier	Barnes Corporation	029-001	For production batch testing
		029-090	For laboratory or environmental applications
14-Lead Dual In-Line (Plastic or Ceramic)	Augat, Inc.	314-AG10	For printed-circuit boards
		314-AG3A	For chassis mounting
		114-AG1B	High-temperature Teflon* for chassis mounting
		114-AG1A	High-temperature Teflon, for printed-circuit boards
	Barnes Corporation	029-275-01	For printed-circuit boards (maintains factory-lead taper)
		029-275-11	For chassis mounting (maintains factory-lead taper)
		029-271-01	Contactor for accepting device in 029-240 carrier for automatic testing
8-Lead TO-5 Style	Augat, Inc.	8058-1G19	Miniature type, Teflon, for chassis mounting
		8058-39G3	Miniature type, Teflon, for printed-circuit boards
	Barnes Corporation	MG-802	Miniature, Teflon, press-fit type
		MGR-81	Miniature, Teflon, for printed-circuit boards
		MF-02-8	For chassis mounting, chamfered-lead entrance
		MF-03-8	For printed-circuit boards, chamfered-lead entrance
10-Lead TO-5 Style	Augat, Inc.	8058-1G22	Miniature type, Teflon, for chassis mounting
		8058-2HG1	Miniature type, Teflon, for printed-circuit boards
	Barnes Corporation	MG-1002	Miniature, Teflon, press-fit type
		MGR-102	Miniature, Teflon, for printed-circuit boards
		MF-02-10	For chassis mounting, chamfered-lead entrance
		MF-03-10	For printed-circuit boards, chamfered-lead entrance
	Sealectro Corp.	Series 60#	Press-fit type, Teflon
12-Lead TO-5 Style	Barnes Corporation	MG-1201	Miniature, Teflon, press-fit type
		MGR-121	Miniature, Teflon, for printed-circuit boards
		MF-02-12	For chassis mounting, chamfered-lead entrance
		MF-03-12	For printed-circuit boards, chamfered-lead entrance
	Sealectro Corp.	Series 60	Press-fit type, Teflon

Registered Trade Mark, Sealectro Corporation
*Registered Trade Mark, E. I. DuPont De Nemours & Co.
▲ AMP Crimpac, Registered Trade Mark, AMP Incorporated

Manufacturers' and/or Suppliers' Addresses

AMP Inc., Harrisburg, Pennsylvania 17105

Augat Inc., 33 Perry Avenue, Attleboro, Massachusetts 02703

Azimuth Electronics, Denville, N. J. 07834

Barnes Corporation, Lansdowne, Pennsylvania 19050

Jettron Products, Inc., 56 Route 10, Hanover, N. J. 07936

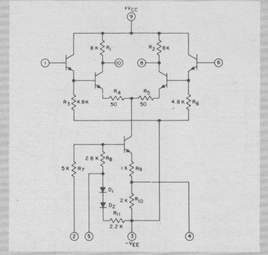
Sealectro Corp., 225 Hoyt Street, Mamaroneck, N. Y. 10543

Differential Amplifiers

DC Amplifier

CA3000

- Schmitt Trigger
- Mixer
- Modulator
- Comparator
- Crystal Oscillator
- Sense Amplifier
- Wide AGC Range: 90dB typ.

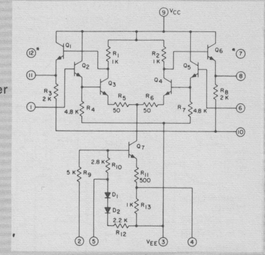


Package:
10-Lead TO-5

Video and Wide-Band Amplifier

CA3001

- Schmitt Trigger
- Mixer
- Modulator
- DC, IF, Video Amplifier
- Emitter Follower Input & Output
- —3dB Bandwidth: 29MHz●



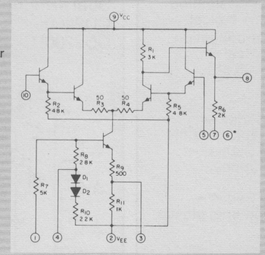
Package:
12-Lead TO-5

*Internal connection Do Not Use.

IF Amplifier

CA3002

- Product Detector
- IF & Video Amplifier
- AM Detector
- Schmitt Trigger
- —3dB Bandwidth: 11MHz

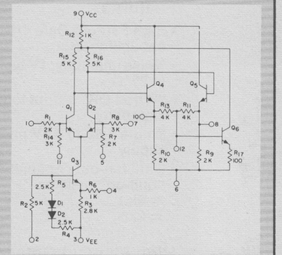


Package:
10-Lead TO-5

AF Amplifier

CA3007

- Audio Driver and Amplifier
- Sound Systems and Communications Equipment
- Eliminates need for Audio Driver Transformer

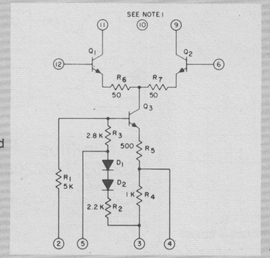


Package:
12-Lead TO-5

RF/IF Amplifiers

CA3004

- Push-Pull Input & Output
- AGC
- Detector
- Mixer
- Limiter
- Wide & Narrow-Band Amplifier
- Cascade Amplifier
- Modulator



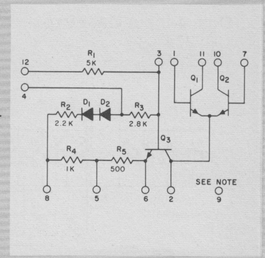
Package:
12-Lead TO-5

Note: Connect Terminal No. 10 to most positive dc supply voltage used for circuit.

CA3005
CA3006

- High Gain, Sharp Limiting Characteristics
- Input Offset Voltage: CA3005 — 2.6mV typ. CA3006 — 1mV max.

(See CA3004 for Applications)

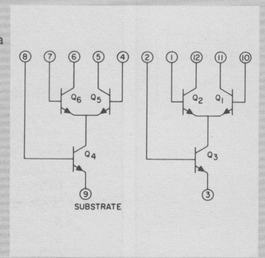


Package:
12-Lead TO-5

Note: Connect Terminal No. 9 to most positive dc supply voltage used for circuit.

CA3026

- Six Transistors on a Single Silicon Chip
- Connected as Two Differential Amplifiers with Constant Current Sinks

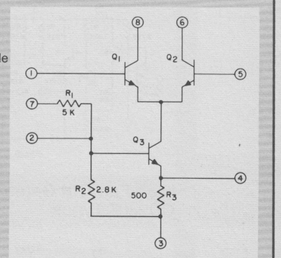


Package:
12-lead TO-5

CA3028A
CA3028B

- Differential or Cascode Amplifier
- Limiter
- Mixer
- Converter, FM Broadcast
- Range: f=DC to 120MHz

CA3028B especially suitable for DC and Differential Amplifier Applications in Control Circuits



Package:
8-Lead TO-5

CA3020 CA3020A Schematic diagrams for these types are shown under High-Gain Wide-Band Amplifiers

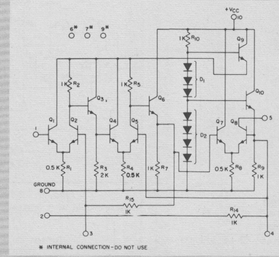
High-Gain Wide-Band Amplifiers

FM/IF Amplifiers

CA3011
CA3012

- High Amplifier Gain: 75dB at 4.5 MHz
- Limiting Sensitivity: 600μV at 10.7MHz (knee)
- Range: f=100kHz to >720MHz

CA3011 is like CA3012 except for Max. DC Supply Voltage:
CA3011 — 7.5V
CA3012 — 10V



Package:
10-Lead TO-5

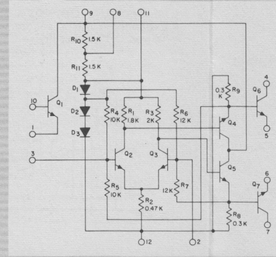
■ INTERNAL CONNECTION - DO NOT USE

Multipurpose Wide-Band Amplifiers

CA3020
CA3020A

- In AF Applications combines functions of preamplifier, Phase-Inverter, Driver and Push-Pull Output
- Servo Amplifier

CA3020A is like CA3020 except for Power Output
Class B Amplifier:
CA3020 — 0.55W typ.
CA3020A — 1W typ.
Sensitivity:
CA3020 — 35mV typ.
CA3020A — 50mV typ.



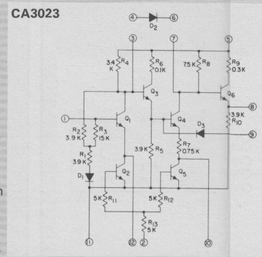
Package:
12-Lead TO-5

Video and Wide-Band Amplifiers

CA3021
CA3022
CA3023

- AM-FM IF Amplifier
- Limiter
- Wide AGC Range: 33dB typ.
- Power Drain: as low as 4mW
- Gain-Controlled Linear Types

Types differ in bandwidth capability, power drain, resistance values



Package:
12-Lead TO-5

CA3013
CA3014
CA3035
CA3035V1
CA3041
CA3042
CA3043

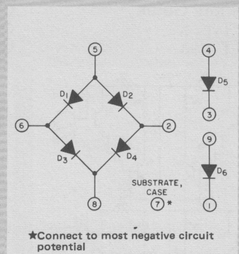
Schematic diagrams for these types are shown under Special-Function Subsystems

Arrays

Diode Arrays

CA3019

- Six Diodes on a Single Chip
- Matched Diodes
- Low Leakage
- Four in Bridge Configuration and Two Isolated Diodes

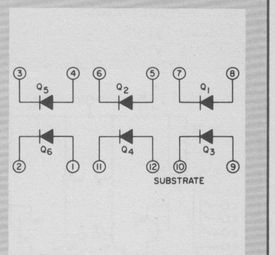


Package:
10-Lead TO-5

★Connect to most negative circuit potential

CA3039

- Six Independent Diodes on a Single Chip



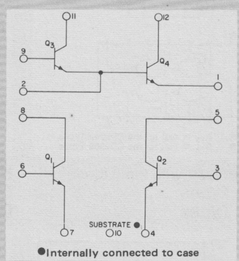
Package:
12-Lead TO-5

Transistor Arrays

CA3018
CA3018A

- Four General-Purpose Transistors, with Two in a Darlington Configuration
- Differential Amplifiers
- Low-Power Applications at f=DC through VHF

CA3018A is like CA3018 but features tighter controls for more critical applications requiring premium performance

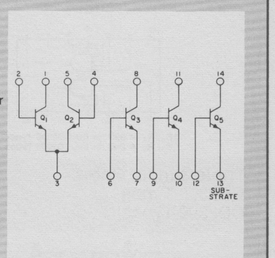


Package:
12-Lead TO-5

●Internally connected to case

CA3045
CA3046

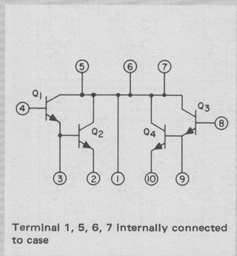
- Three Isolated Transistors and One Differentially-Connected Transistor Pair
- For all Types of Signal-Processing Systems operating from DC to VHF
- Temperature Compensated Amplifiers



Package: 14-Lead dual in-line, ceramic
* Package: 14-Lead dual in-line, plastic

CA3036

- Two Independent Low-Noise Wide-Band Amplifiers
- AF Preamplifier and Low-Level Amplifier for Single-Channel and Stereo Systems
- Matched Transistors with Emitter-Follower Outputs
- f_T=200MHz



Package:
10-Lead TO-5

Terminal 1, 5, 6, 7 internally connected to case

CA3026

Schematic diagram for this type is shown under Differential Amplifiers

CA3035
CA3035V1

Schematic diagrams for these types are shown under Special-Function Subsystems

Note: All resistance values are in OHMS
For Ratings and Characteristics on Linear Integrated Circuits, see pages 6-13 in the RCA Integrated Circuits Product Guide, CDL-820B

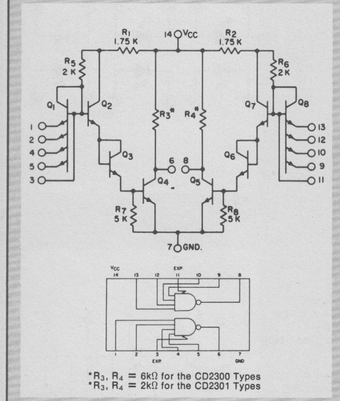
The resistance values included on the schematic diagrams have been supplied as a convenience to assist Equipment Manufacturer's in optimizing the selection of "outboard" components of equipment designs. The values shown may vary as much as ±30%.

RCA reserves the right to make any changes in the Resistance values provided such changes do not adversely affect the published performance characteristics of the device.

Medium-Power DTL

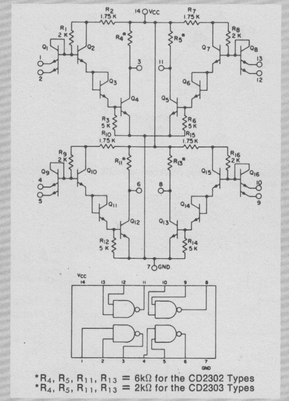
CD2300/930, CD2300D/930,
CD2300/830 Series■

Dual 4-Input Gates
CD2300 Types
CD2301 Types



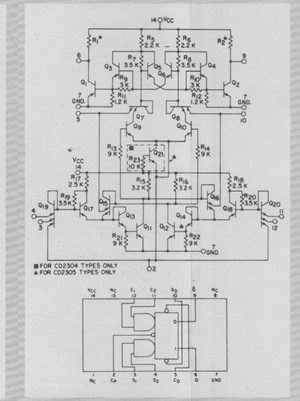
*R_3, R_4 = 6kΩ for the CD2300 Types
*R_3, R_4 = 2kΩ for the CD2301 Types

Quad 2-Input Gates
CD2302 Types
CD2303 Types



*R_4, R_5, R_{11}, R_{13} = 6kΩ for the CD2302 Types
*R_4, R_5, R_{11}, R_{13} = 2kΩ for the CD2303 Types

Clocked Flip-Flops
CD2304 Types
CD2305 Types

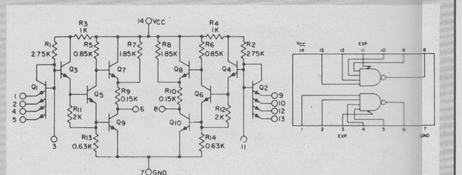


■FOR CD2304 TYPES ONLY
▲FOR CD2305 TYPES ONLY

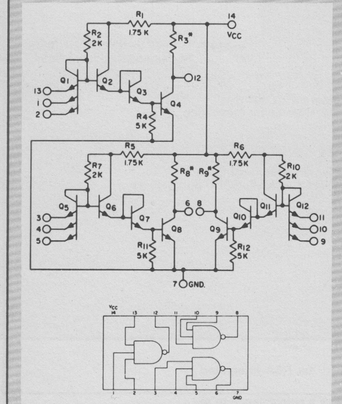
Features

- High Fan-out Gate drive capability, 25
- Noise immunity, 1V typical at 25°C
- "Wired OR" output logic capability
- Single 4.5V to 5.5V power supply
- Gate fan-out capability — "pull-up" resistor
  = 6kΩ 8
  = 2kΩ 7
- Average power dissipation (per gate), 8 mW typical
- Average gate propagation delay, 25 ns typical (fan-out = 7 +35 pF)
- Package:
  CD2300/930 Series — 14-lead flat pack, ceramic
  CD2300D/930 Series — 14-lead dual in-line, ceramic
  CD2300E/830 Series — 14-lead dual in-line, plastic

High Fan-Out Gates with transistor pull-ups
CD2306 Types

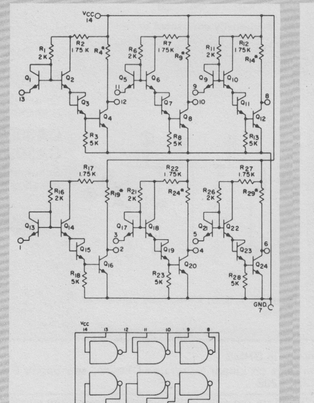


Triple 3-Input Gates
CD2308 Types
CD2309 Types



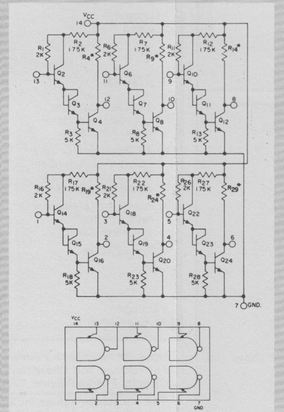
*R_3, R_8, R_9 = 6kΩ for the CD2308 Types
= 2kΩ for the CD2309 Types

Hex Inverters with input diode
CD2310 Types
CD2311 Types



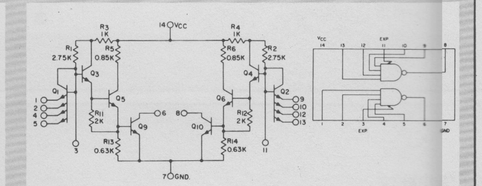
*R_4, R_9, R_{19}, R_{24}, R_{29}:
6kΩ for CD2310 types
2kΩ for CD2311 types

Hex Inverters expandable
CD2312 Types
CD2313 Types

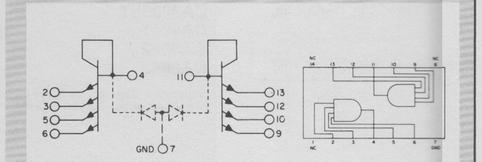


*R_4, R_9, R_{14}, R_{24}, R_{29}:
6kΩ for CD2312 types
2kΩ for CD2313 types

High Fan-Out Gates — without pull-ups
CD2307 Types



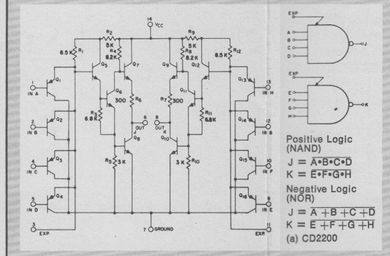
Diode Expanders
CD2314 Types



Low-Power DTL

CD2200, CD2200D Series ★

Dual 4-Input Gate
CD2200
CD2200D

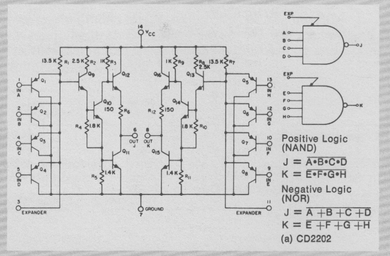


Positive Logic (NAND)
J = A•B•C•D
K = E•F•G•H
Negative Logic (NOR)
J = A +B +C +D
K = E +F +G +H

(a) CD2200

Dual 4-Input Buffer Gate
CD2202, CD2202D

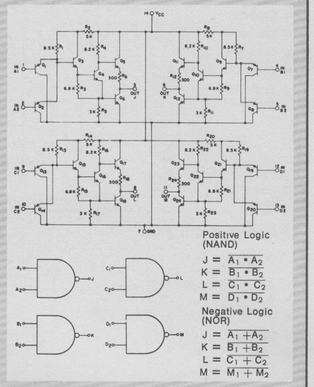
■ Buffer Gate capable of Fan-Out of 25



Positive Logic (NAND)
J = A•B•C•D
K = E•F•G•H
Negative Logic (NOR)
J = A +B +C +D
K = E +F +G +H

(a) CD2202

Quadruple 2-Input Gate
CD2201
CD2201D



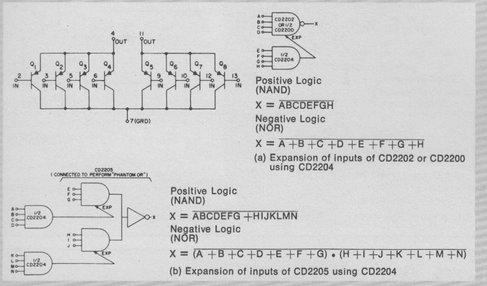
Positive Logic (NAND)
J = $\overline{A_1 \cdot A_2}$
K = $\overline{B_1 \cdot B_2}$
L = $\overline{C_1 \cdot C_2}$
M = $\overline{D_1 \cdot D_2}$
Negative Logic (NOR)
J = $\overline{A_1 + A_2}$
K = $\overline{B_1 + B_2}$
L = $\overline{C_1 + C_2}$
M = $\overline{M_1 + M_2}$

Features

- Very low dissipation 2.3 mW/gate, 7 mW/flip-flop
- Military full-temperature range: −55°C to +125°C
- High noise immunity
- Active pull-up outputs — afford low impedance for driving high capacitive loads
- High breakdown voltage input "Diodes"
- Popular pin configuration; 14 = V_{CC}, 7 = Ground
- Monolithic silicon epitaxial construction
- Aluminum-to-aluminum ultrasonic bonding

★ Packages:
CD2200 Series
14-lead flat pack, ceramic
CD2200D Series
14-lead dual in-line, ceramic

Dual 4-Input Gate Expander
CD2204
CD2204D



Positive Logic (NAND)
X = ABCDEFGH
Negative Logic (NOR)
X = A +B +C +D +E +F +G +H

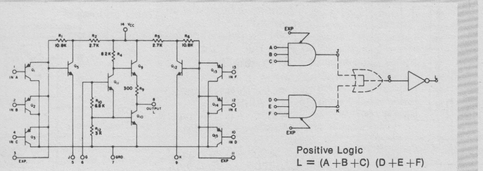
(a) Expansion of inputs of CD2202 or CD2200 using CD2204

Positive Logic (NAND)
X = ABCDEFG +HIJKLMN
Negative Logic (NOR)
X = (A +B +C +D +E +F +G) • (H +I +J +K +L +M +N)

(b) Expansion of inputs of CD2205 using CD2204

Dual 3-Input Gate
CD2205
CD2205D

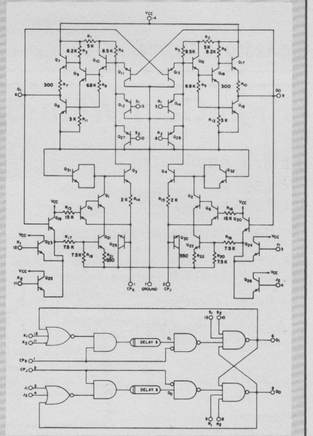
- Performs AND/OR/NOT function
- Expandable "AND" sections
- "Wired OR" capability



Positive Logic
L = (A +B +C) (D +E +F)
Negative Logic
$\overline{L} = (\overline{A} + \overline{B} + \overline{C})\ (\overline{D} + \overline{E} + \overline{F})$

J-K Flip-Flop with set-reset capability
CD2203, CD2203D

- Split Clock Lines
- Dual Inputs: "J" Clock Steering, "K" Clock Steering, DC Set & Reset
- 1.2 MHz Complementing Rate



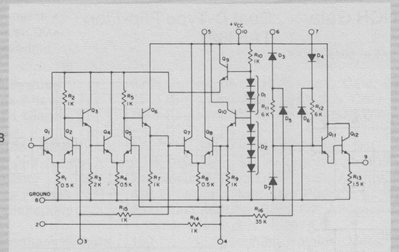
Special-Function Subsystems

Wide-Band Amplifier/Limiter/FM Detector

CA3013
CA3014

- Combines in one package IF Amplifier, AM and Noise Limiter, FM Detector, Audio Preamplifier
- AM Rejection: >50dB at 4.5MHz
- High Amplifier Gain: 75dB at 4.5MHz

CA3013 is like CA3014 except for Max. DC Supply Voltage: CA3013=7.5V CA3014=10V

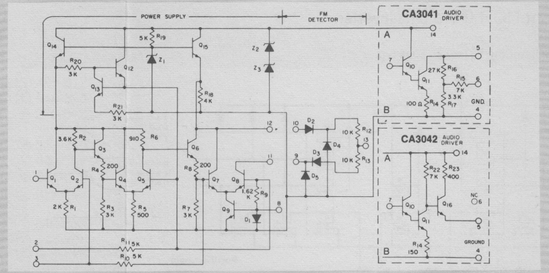


Package: 10-Lead TO-5

Wide-Band Amplifier/Limiter/FM Detector/Audio Driver

CA3041

- For Sound-Systems of TV Receivers using Tube-Type AF Output Amplifiers
- For FM IF Amplifier Communications Systems and High-Fidelity Receivers to 20MHz
- Low Harmonic Distortion and Radiation
- Internal Regulated Voltage Supply
- Limiting Sensitivity: 150μV typ. at 4.5MHz



CA3042

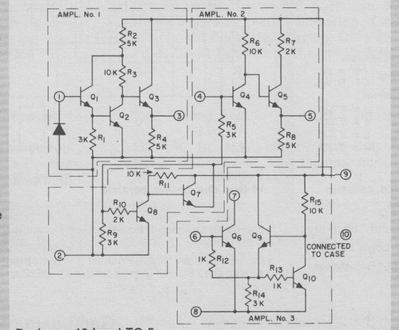
- This type is like the CA3041 but is intended for sound systems of TV Receivers using Transistor-Type AF Output Amplifiers

Package: 14-Lead dual in-line, plastic

Ultra-High-Gain Wide-Band Amplifier Arrays

CA3035
CA3035V1

- Three Individual General-Purpose Amplifiers
- Ideal in Remote-Control Amplifiers, e.g. TV
- High Cascade Voltage Gain: 129dB typ. at 40kHz
- Low-Noise Wide-Band Performance
- Internal Temperature Compensation
- All Amplifiers Single Ended; requires one power supply
- CA3035V1 is like CA3035 but has formed leads

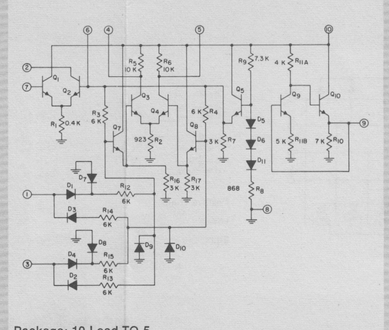


Package: 10-Lead TO-5

High-Frequency Wide-Band Amplifier/Phase Detectors

CA3034
CA3034V1

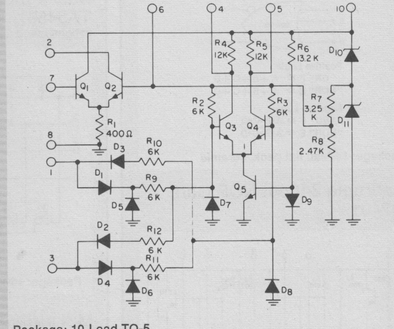
- AFC Applications
- Differential Input Amplifier
- Dual Phase Detector with Differential Output Amplifier
- Compensated Reference Voltage Supply
- CA3034V1 is like CA3034 but has formed leads



Package: 10-Lead TO-5

CA 3044
CA 3044VI

- AFC Applications
- Internal Regulated Voltage Supply
- Differential Input Amplifier
- Dual Phase Detector with Differential Output Amplifier
- CA3044V1 is like CA3044 but has formed leads

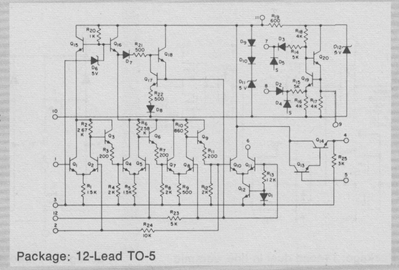


Package: 10-Lead TO-5

High-Gain Wide-Band Amplifier/Limiter/FM Detector/Audio Amplifier

CA3043

- For FM IF Amplifier Communications Systems and High-Fidelity Receivers to 20MHz
- Limiting Sensitivity: 50μV typ. at 10.7MHz
- Low Harmonic Distortion
- Recovered AF Voltage: 100mV at 75kHz deviation



Package: 12-Lead TO-5

Note: All resistance values are in OHMS

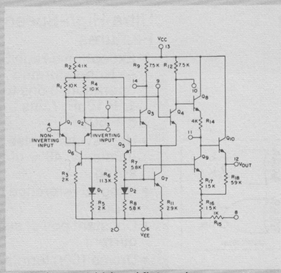
For Ratings and Characteristics on Linear Integrated Circuits, see pages 6-13 in the RCA Integrated Circuits Product Guide, CDL-820B

The resistance values included on the schematic diagrams have been supplied as a convenience to assist Equipment Manufacturer's in optimizing the selection of "outboard" components of equipment designs. The values shown may vary as much as ±30%.

RCA reserves the right to make any changes in the Resistance values provided such changes do not adversely affect the published performance characteristics of the device.

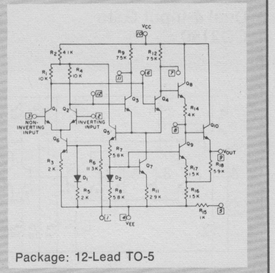
Operational Amplifiers

CA 3008*
CA 3008A*
CA 3016
CA 3016A*
CA 3029▲
CA 3029A▲
CA 3030
CA 3030A▲
CA 3037•
CA 3037A•
CA 3038•
CA 3038A•



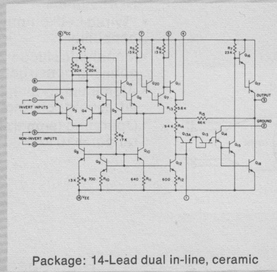
Package: *14-Lead flat pack
▲14-Lead dual in-line, plastic
•14-Lead dual in-line, ceramic

CA 3010
CA 3010A
CA 3015
CA 3015A



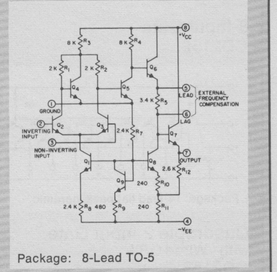
Package: 12-Lead TO-5

CA 3033
CA 3033A



Package: 14-Lead dual in-line, ceramic

CA 3031/702A
CA 3032/702C



Package: 8-Lead TO-5

Applications and Features

- For High-Speed Data Processing and Critical Instrumentation Equipment and Other Applications Requiring Uniform Amplification over a Wide Frequency Range
- Narrow-Band and Band-Pass Amplifiers
- DC and Video Amplifiers
- Comparators ■ Servo Amplifiers
- Oscillators ■ Multivibrators
- Scaling Adders
- Balanced Modulator-Drivers

Types having an "A" suffix have all the desirable features and characteristics of the prototypes, but in addition have lower noise figures and improved input characteristics for offset voltage, offset current, bias current, and impedance.

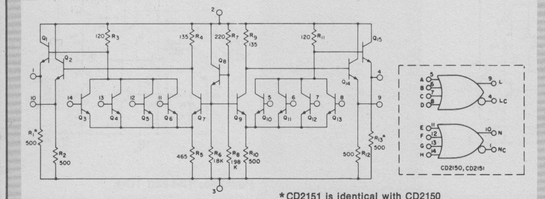
Characteristic		CA3008 CA3008A CA3010 CA3010A CA3029 CA3029A CA3037 CA3037A	CA3015 CA3015A CA3016 CA3016A CA3030 CA3030A CA3038 CA3038A	CA3031/ 702A	CA3032/ 702C	CA3033	CA3033A
Useful Freq. Range	MHz	DC to 15	DC to 50	DC to 40	DC to 40	DC to 0.36	
Oper. Temp. Range	°C	−55 to ± 125▲		−55 to +125	0 to +70	−55 to +125	
Supply Voltage	V	to ±6	to ±12	V_{CC} to −12, V_{EE} to +6		to ±12	to ±18
Static Power Drain	mW						
typ. at Vcc = ±3V		7	7	—	—	—	—
±6V		30	30	—	—	—	—
±12V		—	175	85*	90*	120	
Typ. Voltage Swing	V_{p-p}	6.75	14	10**	10**	22	32
Typ. Voltage Gain	dB	60	70	70	70	90	96

▲ for CA3029, CA3029A 0 to +70° **Minimum *V_{CC} = +12V, V_{EE} = −6V

ECCSL▲-OR/NOR Positive Logic Ultra-High Speed

Dual 4-Input Gate
CD2150

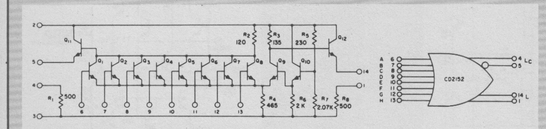
Dual 4-Input Gate with "Wired OR"
CD2151*



*CD2151 is identical with CD2150 except that R_1 and R_{13} are eliminated. "NOR" outputs are unterminated.

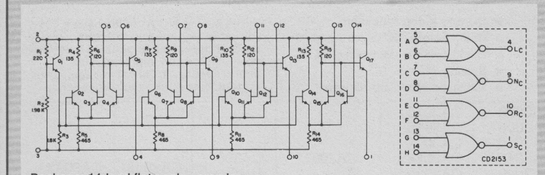
Package: 14-lead flat pack, ceramic

8-Input Gate
CD2152



Package: 14-lead flat pack, ceramic

Quadruple 2-Input Gate with "Wired OR"
CD2153



Package: 14-lead flat pack, ceramic

CD2150, CD2151, CD2152, CD2153

Positive Logic
Level
"1" = −0.76V
"0" = −1.60V
Equations
L = A+B+C+D+E+F+G+H (OR)
LC = A+B+C+D+E+F+G+H (NOR)

Negative Logic
Level
"1" = −1.60V
Equations
L = A•B•C•D•E•F•G•H (AND)
LC = A•B•C•D•E•F•G•H (NAND)

The resistance values included on the schematic diagrams have been supplied as a convenience to assist Equipment Manufacturer's in optimizing the selection of "outboard" components of equipment designs. The values shown may vary as much as ±30%.

RCA reserves the right to make any changes in the Resistance values provided such changes do not adversely affect the published performance characteristics of the device.

For Ratings and Characteristics on Digital Integrated Circuits, see pages 16-21 in the RCA Integrated Circuits Product Guide, CDL-820B.

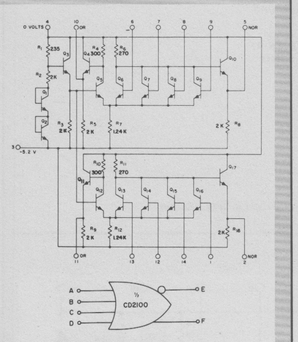
Note: All resistance Values are in OHMS

Ultra-High-Speed Features

- Exceptional High Speed — Non-saturated operation, 3.6ns t_{pd}, 1 + 10pF; 7.5ns t_{pd}, 6 + 60 pF
- High system noise immunity, 40% of logic swing
- Integral reference voltage supply
- Constant power supply current
- Drives 100Ω terminated lines
- Complementary OR/NOR outputs
- "Wired OR" output capability
- Monolithic silicon epitaxial construction
- Aluminum-to-aluminum ultrasonic bonding
- Operating temperature range: +10 to +60°C

High Speed

Dual 4-Input OR/NOR Gate
CD2100

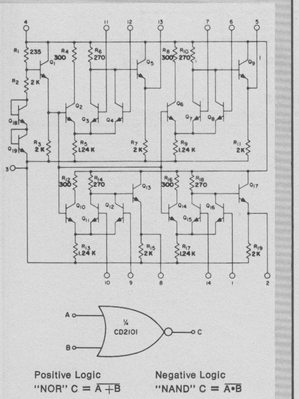


Positive Logic
"OR" F = A+B+C+D
"NOR" E = A+B+C+D

Negative Logic
"AND" F = A•B•C•D
"NOR" E = A•B•C•D

Package: 14-lead flat pack, ceramic

Quadruple 2-Input NOR Gate
CD2101



Positive Logic
"NOR" C = A+B

Negative Logic
"NAND" C = A•B

Package: 14-lead flat pack, ceramic

High Speed Features

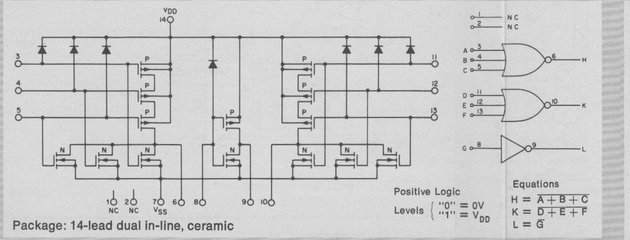
- High Speed — Non-saturated operation — 6ns t_{pd}, 1 + 10pF; 24 ns t_{pd}, 6 + 60pF
- Military full-temperature range: −55°C to +125°C
- CD2100 — Complementary OR/NOR outputs
- Aluminum-to-aluminum ultrasonic bonding
- High system noise immunity, 40% of logic swing
- Integral reference voltage supply
- Constant power supply current

▲Emitter-Coupled Current-Steered Logic, pronounced EXCEL

COS/MOS (Complementary-Symmetry MOS)

Dual 3-Input NOR Gate plus Inverter
TA5361†

- High-Speed Operation: t_{pd} (av) = 50ns typ.



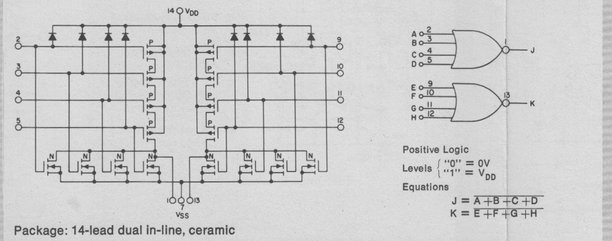
Positive Logic
Levels "0" = 0V, "1" = V_{DD}

Equations
H = A+B+C
K = D+E+F
L = G

Package: 14-lead dual in-line, ceramic

Dual 4-Input NOR Gate
TA5456†

- High-Speed Operation: t_{pd} (av) = 50ns typ.



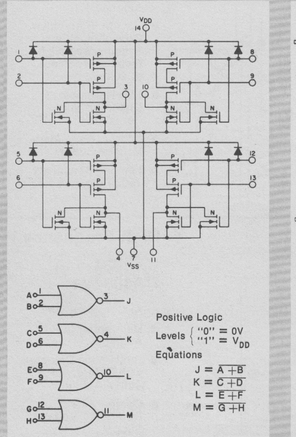
Positive Logic
Levels "0" = 0V, "1" = V_{DD}

Equations
J = A+B+C+D
K = E+F+G+H

Package: 14-lead dual in-line, ceramic

Quadruple 2-Input NOR Gate
TA5455†

- High-Speed Operation: t_{pd} (av) = 50ns typ.



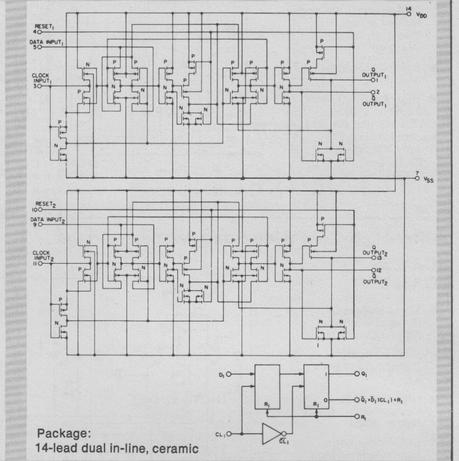
Positive Logic
Levels "0" = 0V, "1" = V_{DD}

Equations
J = A+B
K = C+D
L = E+F
M = G+H

Package: 14-lead dual in-line, ceramic

Dual D-Type Flip-Flop
TA5362†

- Master-Slave Flip-Flop
- DC Reset Capability
- High-Speed Operation: 4MHz

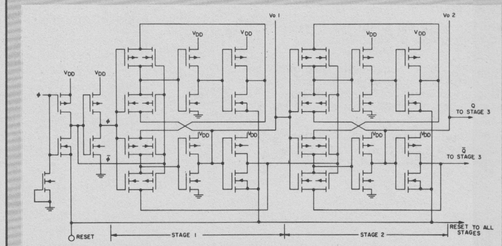


Package: 14-lead dual in-line, ceramic

Features

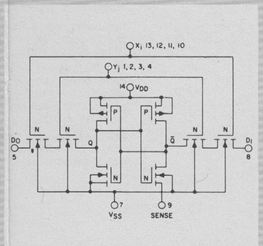
- Large Fanout Capability
- V_{SS} to V_{DD} Logic Swing
- 12^{12} Ω Input Resistance
- Nanowatt Quiescent Power Dissipation
- Operation from Single Positive or Negative Power Supply
- Hermetically Sealed Package
- Full Military Operating Temperature Range: −55°C to +125°C

MSI (Medium-Scale Integration)
7-Stage Ripple Counter
TA5385†



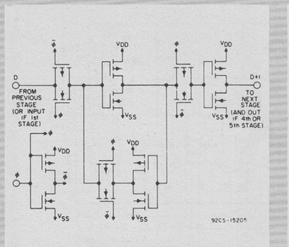
Package: 12-lead TO-5

MSI (Medium-Scale Integration)
16-Bit NDRO Memory Cell
(NDRO — Non Destructive Readout)
TA5406†



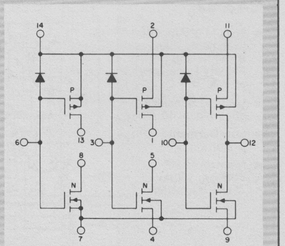
Package: 14-lead dual in-line, ceramic

MSI (Medium-Scale Integration)
18-Bit Static Shift Register
TA5459*



Package: 14-lead dual in-line, ceramic

General Purpose Dual Complementary Pair plus Inverter
TA5388†



Package: 14-lead dual in-line, ceramic

†Developmental Type, Anticipated Commercial Announcement, August 1968

★Developmental Type, Anticipated Commercial Announcement, late in 1968

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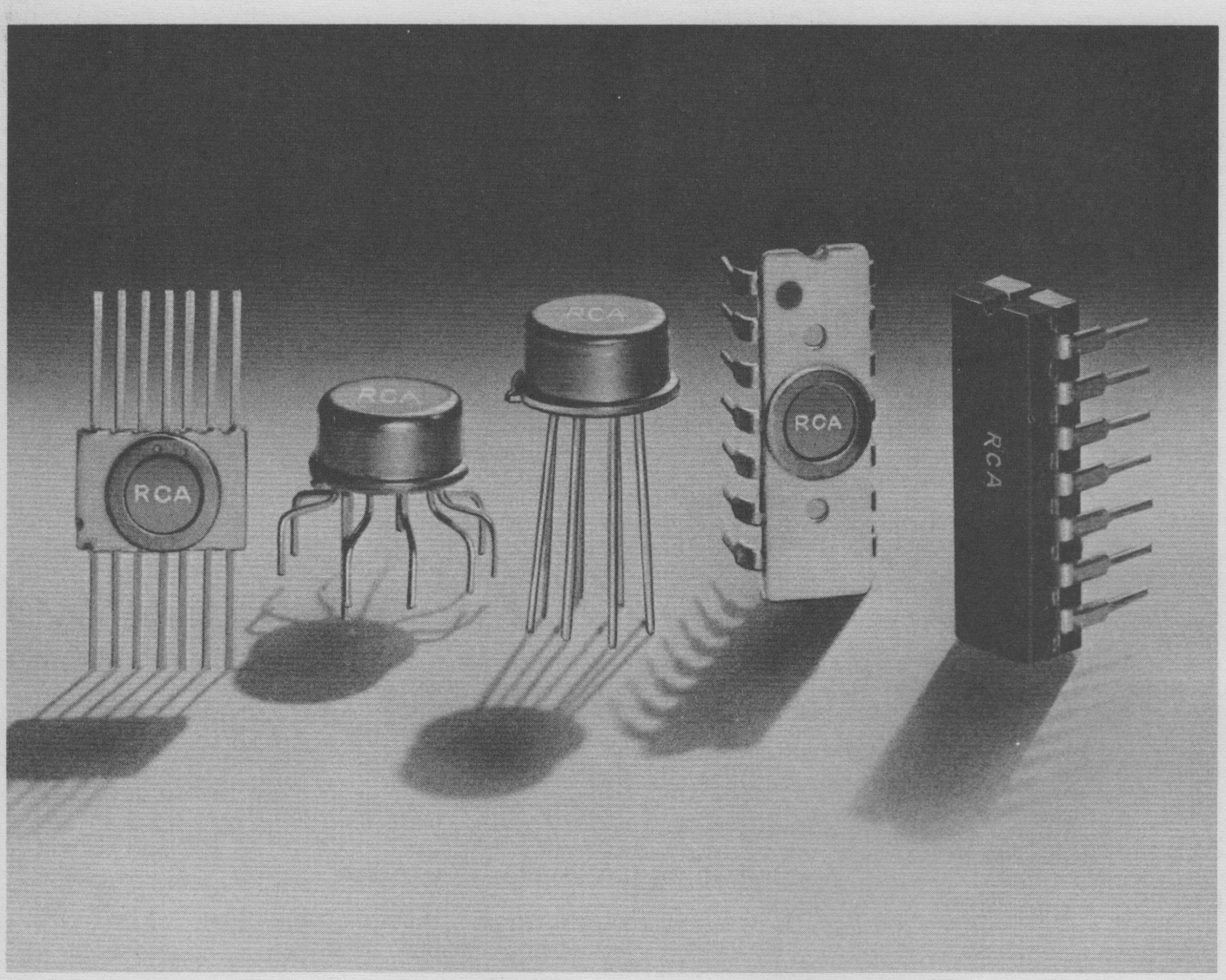

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